



SEW
EURODRIVE

Operating Instructions



Decentralized Drive Controller **MOVIFIT® FDC**





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1 General Information

1.1 How to use this documentation

This documentation is an integral part of the product and contains important information on operation and service. The documentation is intended for all employees who perform assembly, installation, startup and service work on the product.

The documentation must be kept accessible and legible. Ensure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the entire documentation and have understood it. If you are unclear about any of the information in this documentation or require further information, please contact SEW-EURODRIVE.

1.2 Structure of the safety notes

1.2.1 Meaning of the signal words

The following table shows the grading and meaning of the signal words for safety notes, notes on potential risks of damage to property, and other notes.

Signal word	Meaning	Consequences if disregarded
▲ DANGER	Imminent danger	Severe or fatal injuries
▲ WARNING	Possible dangerous situation	Severe or fatal injuries
▲ CAUTION	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the drive system or its environment
INFORMATION	Useful information or tip: Simplifies the handling of the drive system.	

1.2.2 Structure of the section-related safety notes

Section-related safety notes do not apply to a specific action, but to several actions pertaining to one subject. The used symbols indicate either a general or a specific hazard.

This is the formal structure of a section-related safety note:



▲ SIGNAL WORD

Type and source of danger.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the danger.

1.2.3 Structure of the embedded safety notes

Embedded safety notes are directly integrated in the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

- **▲ SIGNAL WORD** Nature and source of hazard.
Possible consequence(s) if disregarded.
– Measure(s) to prevent the danger.

**1.3 Rights to claim under limited warranty**

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the instructions in the documentation. Read the documentation before you start working with the unit.

1.4 Exclusion of liability

You must comply with the information contained in this documentation to ensure safe operation and to achieve the specified product characteristics and performance features. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.

1.5 Copyright

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Copyright law prohibits the unauthorized reproduction, modification, distribution, and use of this instruction manual, in whole or in part.



2 Safety Notes

The following basic safety notes must be read carefully to prevent injury to persons and damage to property. The operator must ensure that the basic safety notes are read and adhered to. Ensure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, or if you require further information, please contact SEW-EURODRIVE.

2.1 Preliminary information

The following safety notes are primarily concerned with the use of MOVIFIT® FDC units. If you use other SEW components, also refer to the safety notes for the respective components in the corresponding documentation.

Please also observe the supplementary safety notes in the individual sections of this documentation.

2.2 General information

Never install damaged products or take them into operation. Submit a complaint to the shipping company immediately in the event of damage.

During operation, MOVIFIT® FDC and the connected MOVIGEAR® and DRC drive units can have live, bare and movable or rotating parts as well as hot surfaces, depending on their degree of protection.

Removing covers without authorization, improper use or incorrect installation and operation may result in severe injuries to persons or damage to machinery.

Refer to the documentation for additional information.

2.3 Target group

Only qualified electricians are authorized to install, startup or service the units or correct unit faults (observing IEC 60364 or CENELEC HD 384 or DIN VDE 0100 and IEC 60664 or DIN VDE 0110 as well as national accident prevention guidelines).

Qualified personnel in the context of these basic safety notes are persons familiar with installation, assembly, startup and operation of the product who possess the necessary qualifications.

Any activities regarding transportation, storage, operation, and disposal must be carried out by persons who have been instructed appropriately.



2.4 Designated use

MOVIFIT[®] FDC and the connected MOVIGEAR[®] and DRC drive units are components intended for installation in electrical plants or machines.

In case of installation in machines, startup of MOVIFIT[®] FDC and the MOVIGEAR[®] and DRC drive units (i.e. start of designated operation) is prohibited until it is determined that the machine meets the requirements stipulated in the Machinery Directive 2006/42/EC.

Startup (i.e. the start of designated use) is only permitted under observance of EMC Directive 2004/108/EC.

MOVIFIT[®] FDC and the connected MOVIGEAR[®] and DRC drive units comply with the regulations of the Low Voltage Directive 2006/95/EC. The standards given in the declaration of conformity are used for MOVIFIT[®] FDC.

You must observe the technical data and information on the connection requirements as provided on the nameplate and in the documentation.

2.4.1 Safety functions

MOVIFIT[®] FDC and the connected MOVIGEAR[®] and DRC drive units may not perform safety functions unless these functions are described and expressly permitted.

For safety applications, ensure that the information in the following publication is observed:

- Manual on the functional safety of the drive unit.

Use only those components in safety applications that were explicitly designed and delivered for this purpose by SEW-EURODRIVE.

2.5 Other applicable documentation

Also observe the documentation for MOVIGEAR[®] and DRC drive units:

- Operating instructions of the connected MOVIGEAR[®] and/or DRC drive units, such as:
 - "MOVIGEAR[®] SNI-B" operating instructions
 - "MOVIGEAR[®] DSC-B" operating instructions
 - "DRC-....-SNI" operating instructions
 - "DRC-....-DSC" operating instructions
- Manual of the fieldbus interface
 - e.g. "Communication Controller DHR21B/41B and MOVIFIT[®] FDC with Fieldbus Interface PROFINET IO" manual
- "Application Configurator" manual



2.6 *Transportation and storage*

Observe the notes on transportation, storage and proper handling. Observe the climatic conditions as stated in the "Technical Data" sections. Do not attach any additional loads. Use suitable, sufficiently rated handling equipment (e.g. rope guides) if required.

2.7 *Installation*

The units must be installed and cooled according to the regulations and specifications in the corresponding documentation.

Protect MOVIFIT® FDC and the MOVIGEAR® and DRC drive units from improper strain.

The following applications are prohibited unless explicitly permitted:

- Use in potentially explosive atmospheres.
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.
- Use in non-stationary applications with strong mechanical oscillation and impact loads; see chapter "Technical Data".

2.8 *Electrical connection*

Observe applicable national accident prevention guidelines (e.g. BGV A3) when working on a live MOVIFIT® FDC unit.

Perform electrical installation according to the pertinent regulations (e.g. cable cross sections, fusing, protective conductor connection). For any additional information, refer to the applicable documentation.

You find notes on EMC-compliant installation, such as shielding, grounding, arrangement of filters, and routing of lines in the documentation for MOVIFIT® FDC and the MOVIGEAR® and DRC drive units. The manufacturer of the system or machine is responsible for maintaining the limits established by EMC legislation.

Protective measures and protection devices must comply with the regulations in force (e.g. EN 60204-1 or EN 61800-5-1).

2.9 *Safe disconnection*

MOVIFIT® FDC and the MOVIGEAR® and DRC drive units meet all requirements for safe disconnection of power and electronics connections in accordance with EN 61800-5-1. All connected circuits must also satisfy the requirements for safe disconnection to ensure reliable isolation.



2.10 Operation

Systems with integrated MOVIFIT[®] FDC and MOVIGEAR[®] and DRC drive units must be equipped with additional monitoring and protection devices according to the applicable safety guidelines, such as the law governing technical equipment, accident prevention regulations, etc. Additional protective measures may be necessary for applications with increased potential risk. It is permitted to modify MOVIFIT[®] FDC as well as MOVIGEAR[®] and DRC drive units using the operating software.

Do not touch live components or power connections immediately after disconnecting MOVIFIT[®] FDC as well as MOVIGEAR[®] and DRC drive units from the supply voltage because some capacitors may still be charged. Wait at least 5 minutes after having switched off the supply voltage.

As soon as supply voltage is present at the MOVIFIT[®] FDC or MOVIGEAR[®] and DRC drive units, the terminal boxes of the units must be closed (i.e. the MOVIFIT[®] EBOX as well as any connectors of SNI cables or hybrid cables must be plugged in and screwed on). The degree of protection of MOVIFIT[®] FDC specified in the technical data chapter applies only if the EBOX is installed on the ABOX.

Never disconnect power plug connectors during operation. Doing so can lead to dangerous electric arcs forming, which can cause irreparable damage to the unit (fire risk, irreparable contacts).

Important: The maintenance switch of MOVIFIT[®] disconnects only the MOVIGEAR[®] and DRC drive units from the power supply system. The terminals of the MOVIFIT[®] FDC unit are still connected to the power supply after the maintenance switch is activated.

The unit may still be live and connected to the supply system, even if the operation LEDs and other display elements are no longer illuminated.

The bus cycle and timeout times effective in the system must be taken into account during project planning and when dimensioning the system.

Mechanical blocking or internal safety functions of the unit can cause a motor standstill. Removing the cause of this problem or performing a reset can result in the MOVIGEAR[®] and DRC drive unit re-starting on its own. If this is not permitted for the driven machine for safety reasons, disconnect the unit from the supply system before correcting the error.

Caution: Danger of burns: The temperature of the surface of MOVIFIT[®] FDC as well as of MOVIGEAR[®] and DRC drive units can exceed 60 °C during operation.



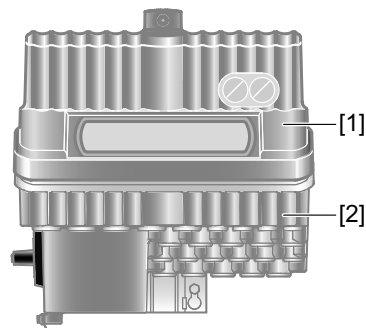
3 Unit Structure

3.1 MOVIFIT® FDC

MOVIFIT® FDC is a decentralized drive controller for controlling the following units:

- MOVIGEAR® SNI-B drive units
- MOVIGEAR® DSC-B drive units
- DRC-SNI drive units
- DRC-DSC drive units
- MOVIFIT® FC slave units

The following figure shows the standard version of a MOVIFIT® FDC-SNI unit as an example:



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- [1] EBOX (active electronics unit)
- [2] ABOX (passive connection unit)

3.1.1 Features of MOVIFIT® FDC

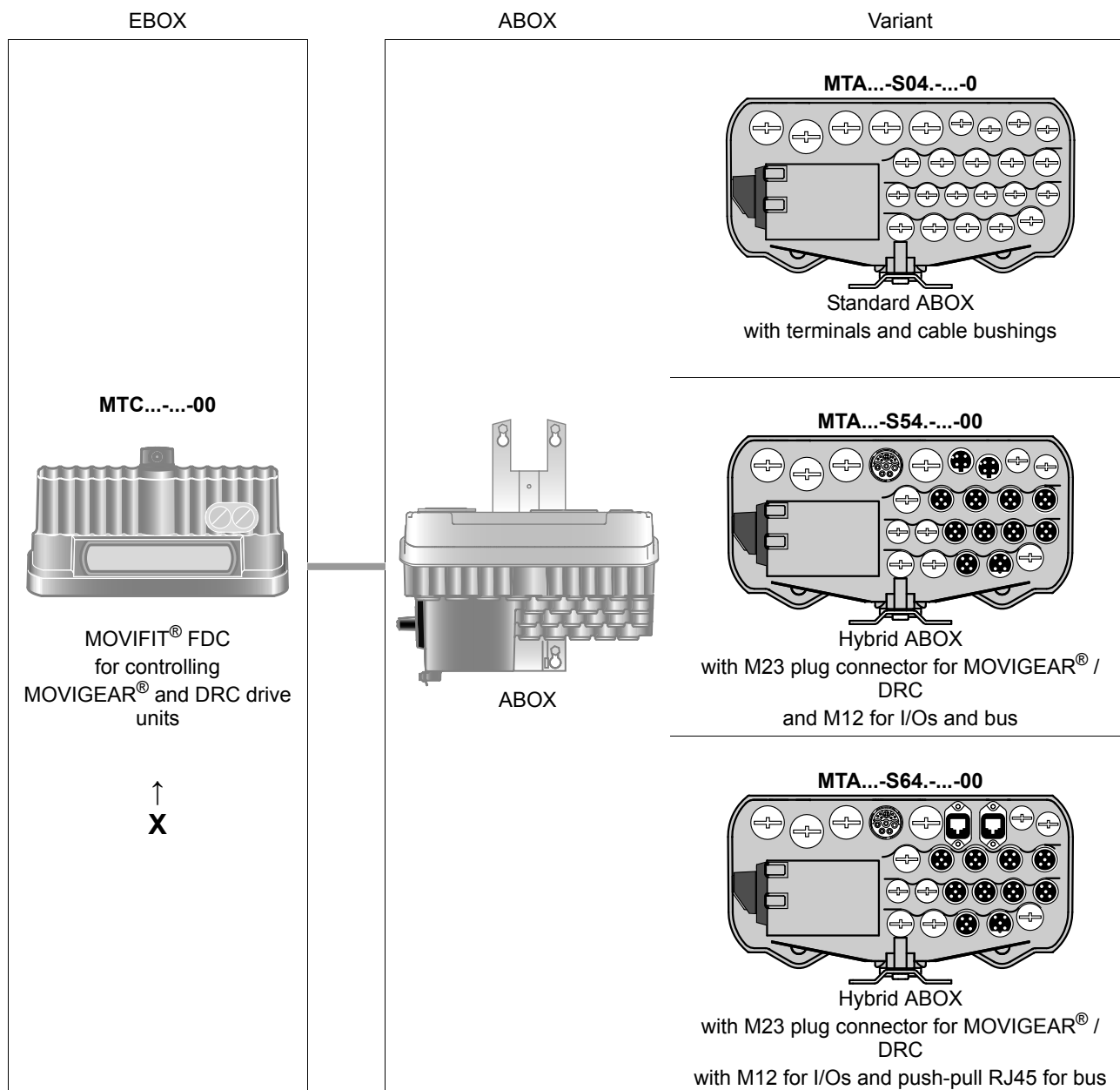
MOVIFIT® FDC is characterized by the following features:

- Up to 10 SNI actuators or 16 SBus actuators can be connected
- **Single-Line Network Installation (SNI)** and/or SBus communication
- Industrial Ethernet with the following protocols:
 - PROFINET IO
 - Modbus/TCP
 - EtherNet/IP
- Service interface via:
 - USB
 - Ethernet
- Maintenance switch
- 12 binary inputs + 4 binary inputs/outputs
- Configurable application modules
- User-defined programming in accordance with IEC 61131-3
- Easy data management with SD memory card

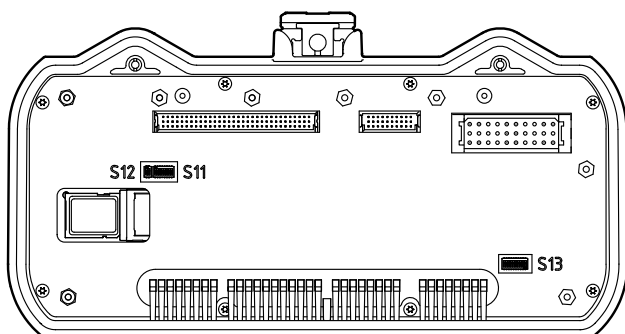


3.2 Overview

The following figure shows the MOVIFIT® FDC variants described in these operating instructions with the standard ABOX and the hybrid ABOX.



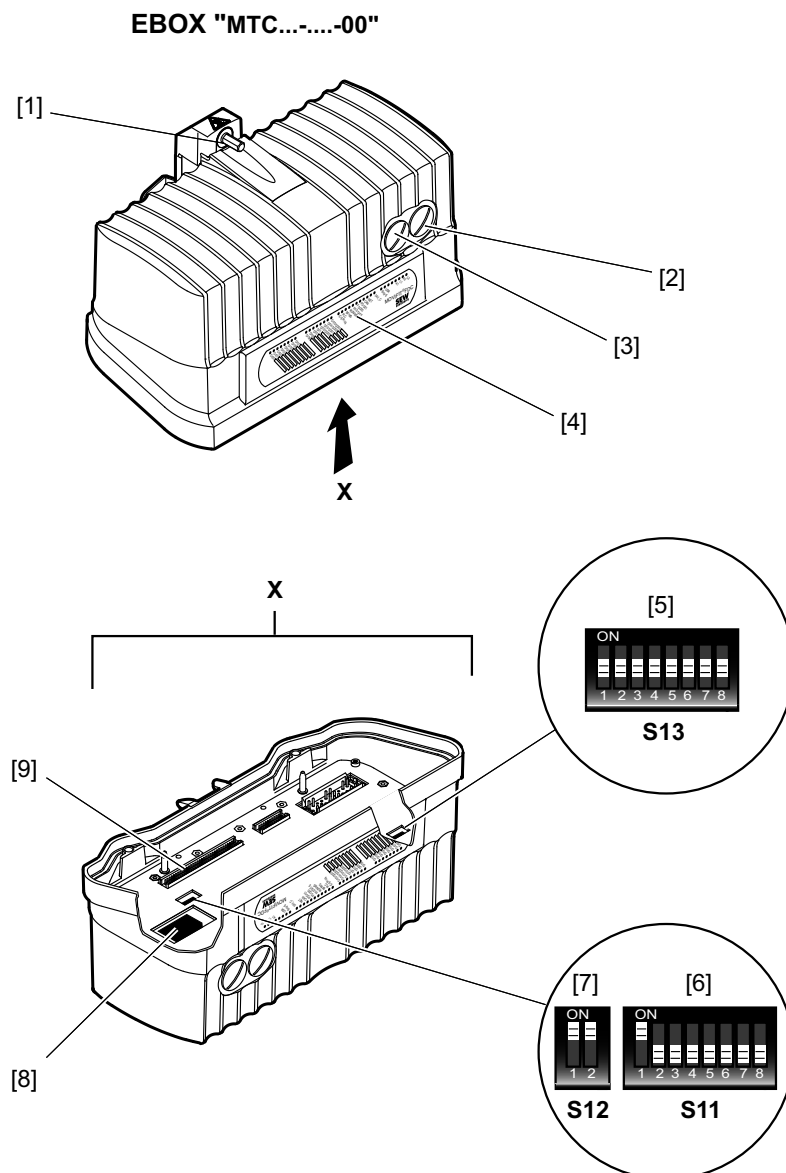
X: Detailed view of the EBOX from bottom





3.3 EBOX (active electronics unit)

The MOVIFIT® FDC EBOX is a closed electronics unit with communication interface and I/Os for controlling MOVIGEAR® and DRC drive units:



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- [1] Central opening/closing mechanism
- [2] EtherNet service interface (underneath the screw plug)
Use only screw plugs with part number 1 813 062 3.
- [3] USB interface (underneath the screw plug)
Use only screw plugs with part number 1 813 062 3.
- [4] Operation LEDs for I/Os (can be labeled), communication, and device status
- [5] DIP switch S13 (reserved) **Do not change** the DIP switch setting.
- [6] DIP switch S11 (reserved) **Do not change** the DIP switch setting.
- [7] DIP switch S12 for selecting the communication protocol
PROFINET or EtherNet/IP
- [8] SD memory card
- [9] Connection to connection box



3.3.1 SD memory card

The SD memory card is used for central data management of MOVIFIT[®] FDC and allows for easily replacing the EBOX during servicing. It contains the firmware, the IEC program, and user data.

You find the memory card slot inside the EBOX. This position ensures the degree of protection of MOVIFIT[®] FDC and enables easy access.

MOVIFIT[®] FDC is available with the following memory cards:

Code	Performance class	SD card	
		Type	Property
R95	CCU standard	OMC41B-T0	Parameterizable
R96	MOVI-PLC [®] standard	OMH41B-T0	Programmable
R97	CCU advanced	OMC41B-T0 to OMC41B-T25	Parameterizable
R98	MOVI-PLC [®] advanced	OMH41B-T0 to OMH41B-T25	Programmable

- When using the SD memory card OMC41B-T..., you can freely set the parameters for MOVIFIT[®] FDC.
- When using SD memory card OMH41B-T, you can freely program MOVIFIT[®] FDC (programming languages in accordance with IEC 61131-3).



3.3.2 Configurable application controller (control card)

When using an SD card of the type OMC41B-T0, you can use MOVIFIT® FDC as configurable application controller (CCU). The *Application Configurator* program module can be used to execute standardized application modules created by SEW-EURODRIVE. The application modules can be started up quickly and conveniently by graphical configuration. A defined process data interface provides this functionality to the higher-level controller. A process data monitor with control mode is available to support the startup procedure.

Performance class CCU standard

The performance class CCU standard is intended for application modules with single-axis functionality and medium response times. A maximum of 16 axes (max. 10 of them SNI axes) can be connected to a configurable application controller. The following application modules are available and can be started up using the *Application Configurator* tool.

- Speed control
- Cam positioning
- Bus positioning with 6 process data
- Single-axis universal module

Performance class CCU advanced

The performance class CCU advanced is intended for application modules with single-axis and multi-axis functionality and fast response times. The following application modules are available:

- Single-axis functionality:
 - Speed control
 - Cam positioning
 - Bus positioning with 6 process data words
 - Single-axis universal module
- Multi-axis functionality (in preparation):
 - SyncCrane
 - Energy-efficient SRU



3.3.3 Freely programmable motion and logic controller card (MOVI-PLC®)

When using an SD card of the type OMH41B-T0, you can use MOVIFIT® FDC as freely programmable motion and logic controller MOVI-PLC®. MOVI-PLC® is a series of programmable motion and logic controllers. It allows drive solutions, logic processes and sequence controls to be automated simply and efficiently using IEC 61131-3 compliant programming languages.

- MOVI-PLC® is a **universal** solution because it is able to control the entire portfolio of SEW inverters and offers a simple upgrade to a more powerful MOVI-PLC® version thanks to the universal execution of the programs.
- MOVI-PLC® is **scalable** due to several different hardware platforms (standard, advanced, etc.) and modular software concepts (libraries for numerous applications).
- MOVI-PLC® is **powerful** due to extensive technologies (such as electronic cam, synchronous operation) and the control of demanding applications (such as material handling).

Performance-class MOVI-PLC® standard

The control card of the performance class MOVI-PLC® standard enables coordinated single axis movements and integration of external inputs/outputs as well as drive operator panels (DOP). The control card is therefore suitable for use as a module controller or stand-alone controller for machines of medium complexity. SEW-EURODRIVE recommends the program module *MultiMotion Light* for programming.

Performance class MOVI-PLC® advanced

The performance class MOVI-PLC® advanced supplements the performance class MOVI-PLC® standard by short response times and the possibility of executing complex technology functions, such as synchronous operation, electronic cam or robotics. SEW-EURODRIVE recommends the program module *MultiMotion* for programming.

3.3.4 Actuator module (SNI)

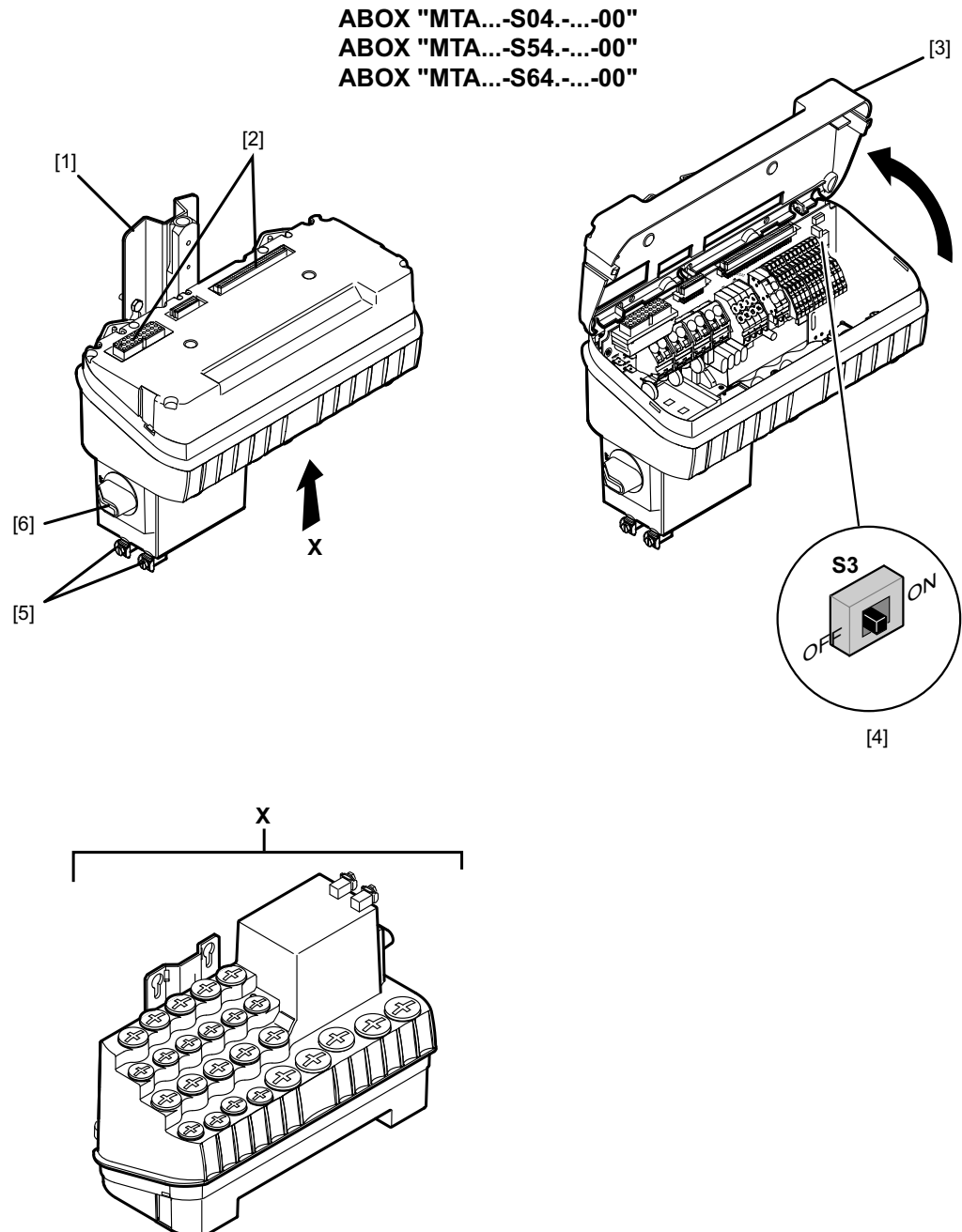
The actuator module of the EBOX modulates the SNI signal onto the supply system cable. This means the same SNI cable is used for communication and power supply of the connected MOVIGEAR® and DRC drive units (**SNI = Single Line Network Installation**).

See chapter "Operation" > "Status LEDs" (page 95) for more information.



3.4 ABOX (passive connection unit)

The following figure shows the MOVIFIT® standard ABOX "MTA...-S04...-00" as an example:



3041002251

- [1] Mounting rail
- [2] Connection to EBOX
- [3] Protection cover
- [4] DIP switch S3 for SBus bus termination
- [5] Grounding screws
- [6] Maintenance switch



Unit Structure

ABOX (passive connection unit)

3.4.1 Maintenance switch

The maintenance switch of the ABOX is used to disconnect the AC 400 V power supply in the ABOX. The maintenance switch can be secured with 3 locks.

When the maintenance switch is in "0" position, the MOVIGEAR® and DRC drive units are disconnected from the 400 V voltage supply. Voltage is still present on some terminals in the ABOX.



⚠ WARNING

Electric shock due to dangerous voltages present in the ABOX.

Severe or fatal injuries.

- Disconnect the power interface from the power supply before you perform any work on the unit.
- Observe a minimum switch-off time of 5 minutes after disconnecting the power supply.



INFORMATION

When a valid enable signal for a MOVIGEAR® or DRC drive unit is pending at MOVIFIT® FDC, the motor is supplied with current as soon as the maintenance switch is set to "1".



NOTICE

Increased wear of the switch contacts.

Destruction of the switch contacts.

- Do not operate the maintenance switch under load.

As an alternative, the ABOX is equipped with the following line and equipment protection:

Cable cross section SNI cable / hybrid cable	Short designation	Line and equipment protection
4 x 2.5 mm ² / 4 x AWG14	M16	15 A
4 x 4.0 mm ² / 4 x AWG12	M20	20 A



3.5 *Version for wet areas / corrosion protection (optional)*

3.5.1 Characteristics

The version for wet areas has the following characteristics:

- IP65 in accordance with EN 60529 (MOVIFIT® housing closed and all cable entries and plug connection sealed according to the relevant degree of protection)
- Easy-to-clean housing (self-draining design)
- Specially treated surface with anti-stick properties (= surface protection HP200)
- High impact resistance of the surface against mechanical damage
- Specifically treated mounting rail with anti-stick properties
(= HP200 surface treatment)



INFORMATION

The version for wet areas is only available in connection with the standard ABOX "MTA13...-S04.-...-00".

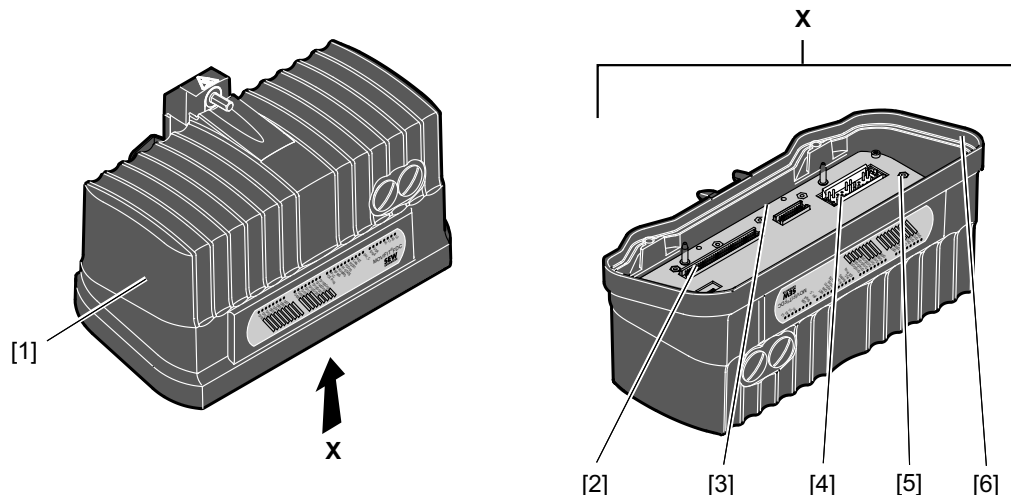


Unit Structure

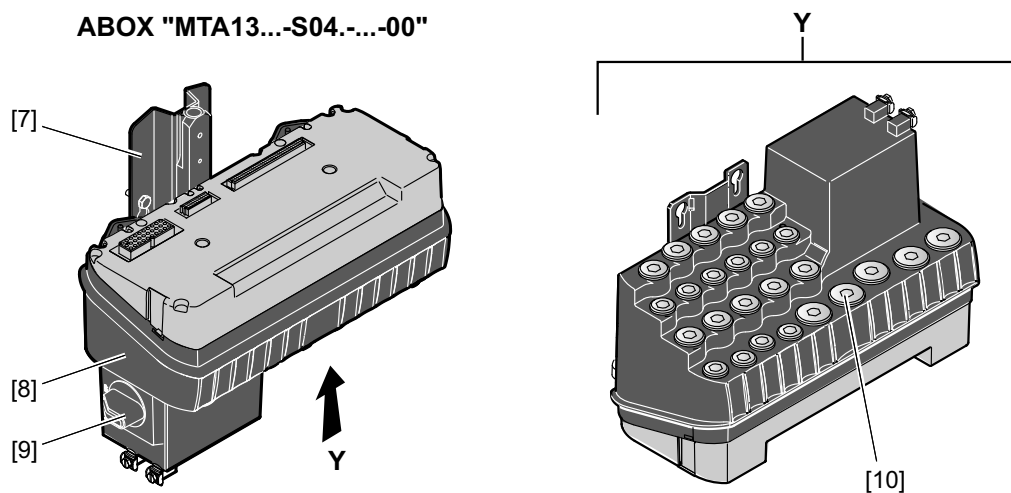
Version for wet areas / corrosion protection (optional)

The following figure depicts the additional features of MOVIFIT® units in the version for wet areas:

EBOX "MTC13...-...-00"



ABOX "MTA13...-S04.-...-00"



3041025291

- [1] EBOX with special surface treatment (available only in one color)
- [2] Signal plug connector
- [3] Gasket between ABOX and cover plate
- [4] Power plug connector
- [5] Screws with thread sealant
- [6] Replaceable profile seal
- [7] Mounting rail with special surface treatment
- [8] ABOX with special surface treatment (available only in one color)
- [9] Maintenance switch
- [10] Stainless steel screw plugs (optionally available)

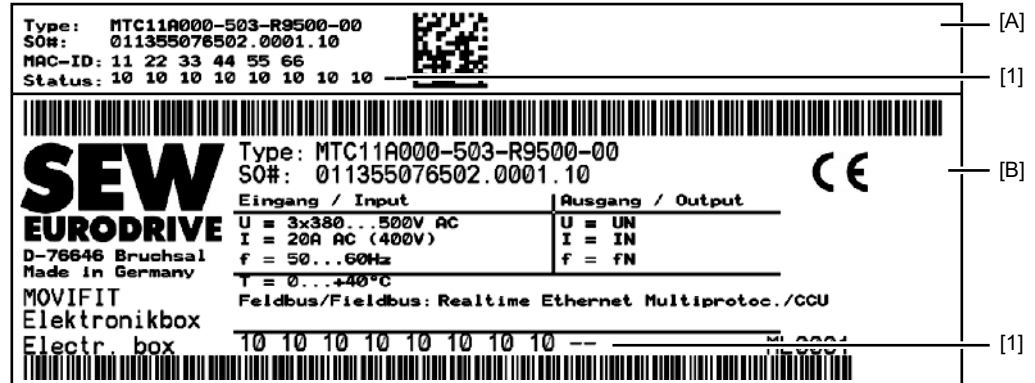


3.6 Type designation MOVIFIT® FDC

3.6.1 EBOX

Nameplate

The following figure shows an example nameplate of the EBOX of MOVIFIT® FDC:



[A] External nameplate

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[B] Internal nameplate

[1] EBOX status field

Type designation

The following table shows the type designation of the EBOX of MOVIFIT® FDC:

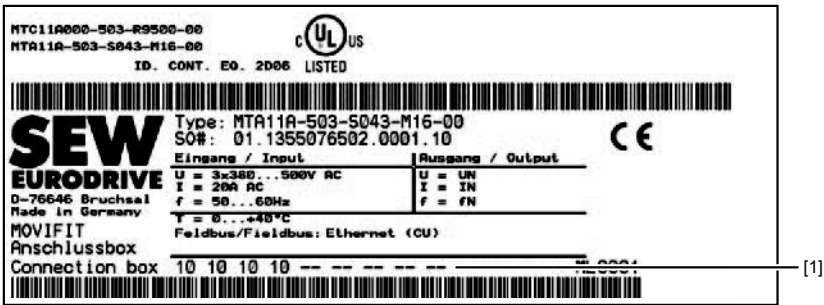
MT C 11 A 000 - 503 - R9500 - 00

	EBOX variant
	00 = Series
	Performance class type (SD card)
	R95.. = OMC41B-T0 (CCU standard, parameterizable)
	R96.. = OMH41B-T0 (MOVI-PLC® standard, programmable)
	R97.. = OMC41B-T0 – OMC41B-T25 (CCU advanced, parameterizable)
	R98.. = OMH41B-T0 – OMH41B-T25 (MOVI-PLC® advanced, programmable)
	Supply phases
	3 = 3-phase (AC)
	Supply voltage
	50 = 380 V – 500 V
	Power
	000 = MTC variant (MOVIFIT® FDC)
	Version A
	Series
	11 = Standard (IP65)
	13 = Variant for wet areas (IP65)
	Unit type
	C = MOVIFIT® FDC
	MT = MOVIFIT® unit series



3.6.2 ABOX
Nameplate

The following figure shows an example nameplate of the ABOX of MOVIFIT® FDC:



3304573579

[1] ABOX status field

Type designation

The following table shows the type designation of the ABOX of MOVIFIT® FDC:

MT A 11 A - 50 3 - S04 3 - M16 - 00 /M11

	ABOX option M11 = Stainless steel mounting rail
	ABOX variant 00 = Series
	Maintenance switch M16 = Load disconnecter + line protection up to 15 A M20 = Load disconnecter + line protection up to 20 A
	Fieldbus 3 = PROFINET IO, EtherNet/IP, Modbus/TCP
	Connection configuration S04 = Standard ABOX with terminals and cable bushings S54 = Hybrid ABOX with M12 for I/Os + bus and plug connector for MOVIGEAR® / DRC S64 = Hybrid ABOX with M12 for I/Os, push-pull RJ45 for bus and plug connector for MOVIGEAR® / DRC
	Supply phases 3 = 3-phase (AC)
	Supply voltage 50 = 380 V – 500 V
	A = Version
	Series 11 = Standard (IP65) 13 = Version for wet areas (IP65)
	Unit type A = ABOX (connection box)
	MT = MOVIFIT® unit series



4 Mechanical Installation

4.1 General information



⚠ CAUTION

Risk of injury due to protruding parts, especially the mounting rail.

Risk of cutting or crushing.

- Cover sharp and protruding parts, especially the mounting rail, to protect against injury and damage.
- MOVIFIT® FDC may only be installed by qualified personnel.

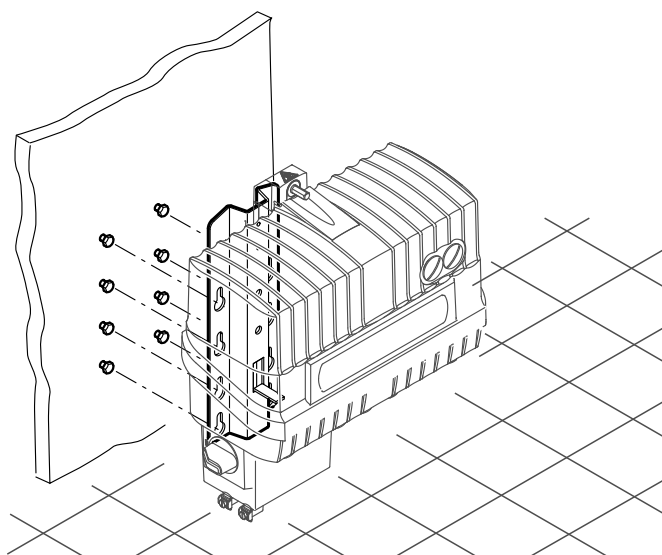
Observe the following notes on mechanical installation:

- Only install MOVIFIT® FDC on a level, low-vibration, and torsionally rigid support structure, see "Permitted mounting position" chapter.
- Observe the general safety notes.
- Strictly observe all instructions as to the technical data and the permissible conditions regarding the place of installation.
- Use only the provided attachment options when mounting the unit.
- When selecting and dimensioning the mounting and safety elements, observe the applicable standards, the technical data of the unit, and the local circumstances.

4.2 Permitted mounting position

The following figure shows the permitted mounting positions for MOVIFIT® FDC:

MOVIFIT® FDC is attached by means of a mounting plate using the 4 screws already installed in the mounting surface. Refer to the "Mounting" chapter for more information.



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INFORMATION

This chapter gives an example of the standard version with terminals and cable bushings. However, the installation notes apply to all variants.



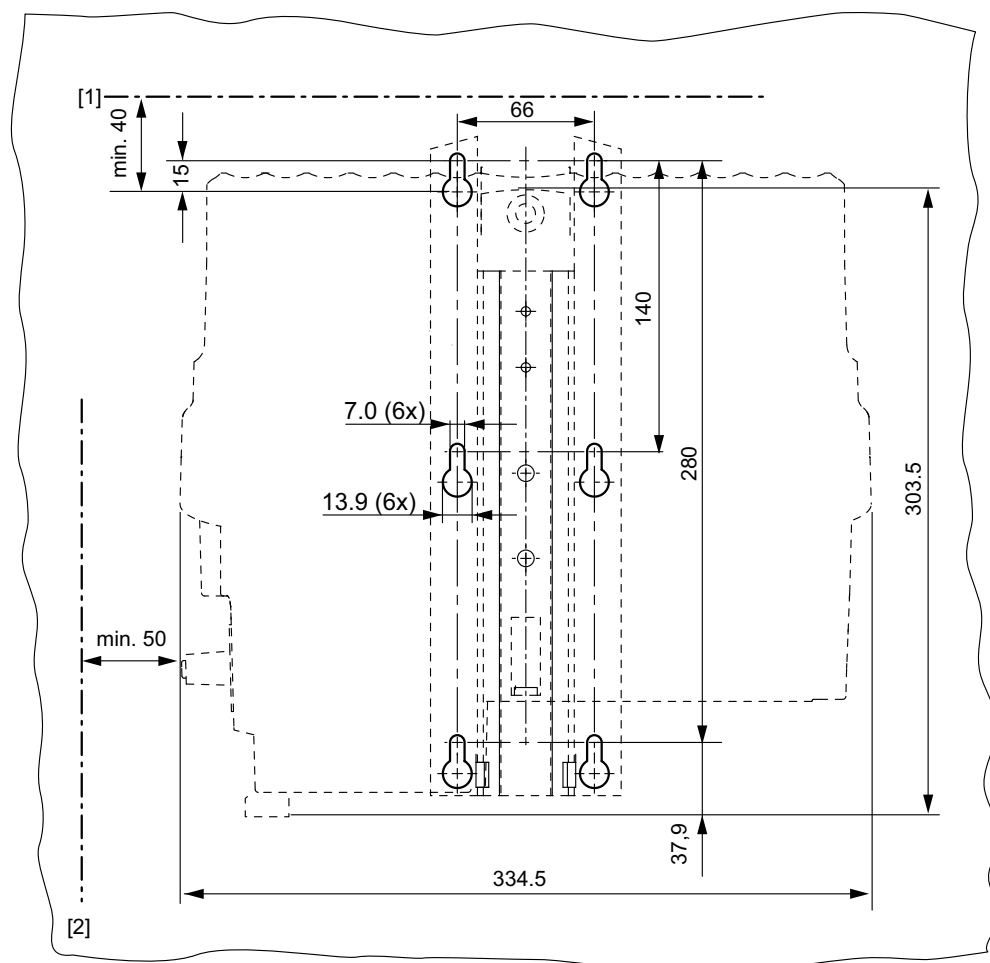
4.3 Mounting

4.3.1 Mounting rail

MOVIFIT® FDC is equipped with a mounting rail to attach the unit to a level, low-vibration mounting surface using screws of size M6.

For bore dimensions of the respective type of fixture, see the following figures.

Drilling template for the standard mounting rail



9007202299435147



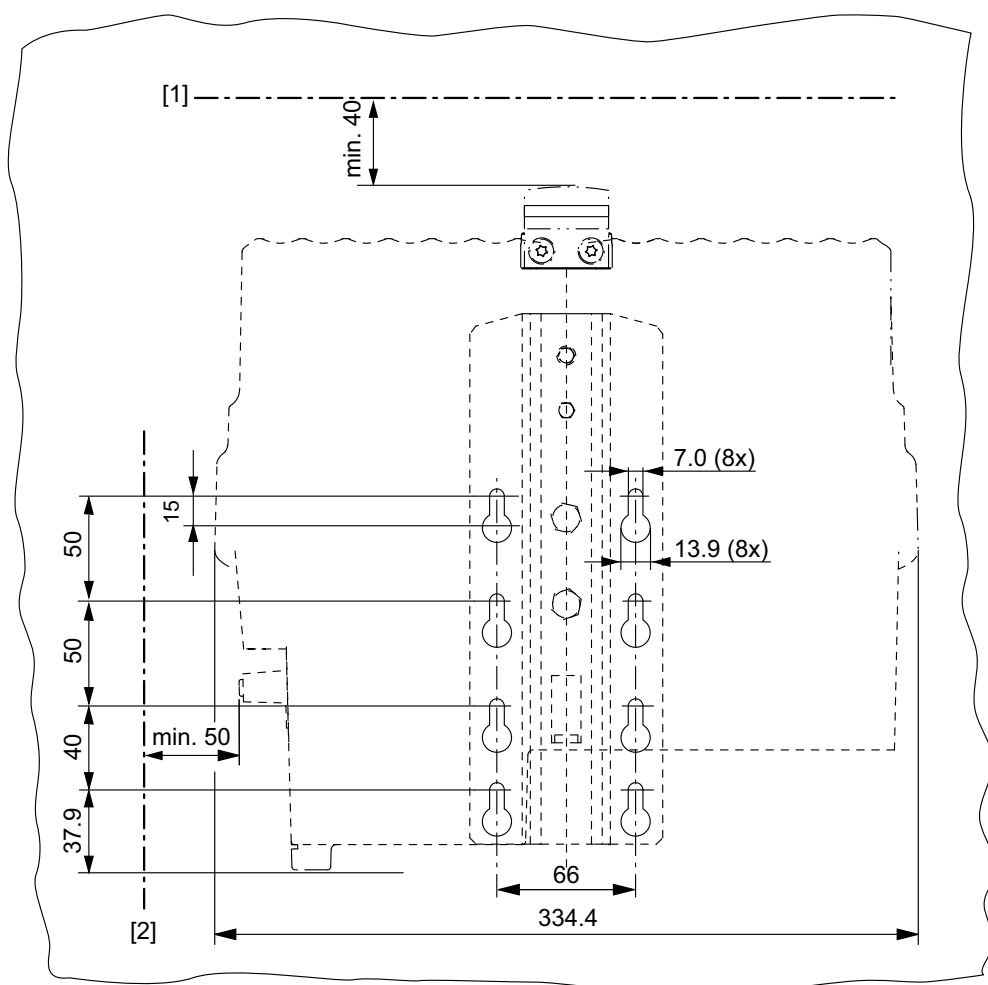
INFORMATION

- [1] Observe the minimum installation clearance so that the EBOX can be removed from the ABOX.
- [2] Observe the minimum installation clearance required to operate the maintenance switch and to ensure heat dissipation for the unit.
- Make sure that the permitted bending radii of the cables used are not exceeded when connecting the cables.

You find detailed dimension drawings in the "Dimension drawings" (page 115) chapter.



Drilling template for the optional stainless mounting rail M11



9007202299484811



INFORMATION

- [1] Observe the minimum installation clearance so that the EBOX can be removed from the ABOX.
- [2] Observe the minimum installation clearance required to operate the maintenance switch and to ensure heat dissipation for the unit.
- Make sure that the permitted bending radii of the cables used are not exceeded when connecting the cables.

You find detailed dimension drawings in the "Dimension drawings" (page 115) chapter.



4.3.2 Mounting



⚠ WARNING

Risk of crushing if the load falls.

Severe or fatal injuries.

- Do not stand under the load.
- Secure the danger zone.



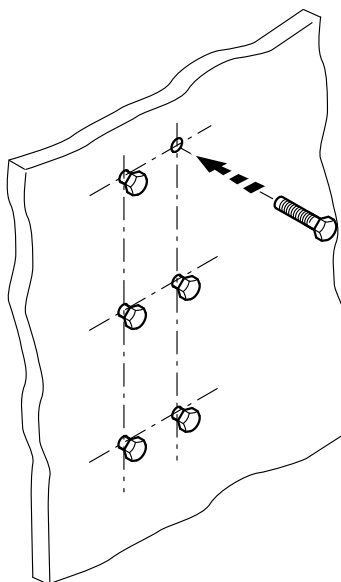
⚠ CAUTION

Risk of injury due to protruding parts.

Risk of cutting or crushing.

- Cover sharp and protruding parts.
- The installation must only be carried out by qualified personnel.

1. Bore the holes required for mounting at least 4 screws into the mounting surface according to the previous figures. SEW-EURODRIVE recommends screws of size M6 and suitable dowel pins, if necessary.
2. Mount at least 4 screws on the mounting surface.
Use appropriate washers or screw and washer assemblies for the mounting plates with special surface treatment for versions used in wet areas.

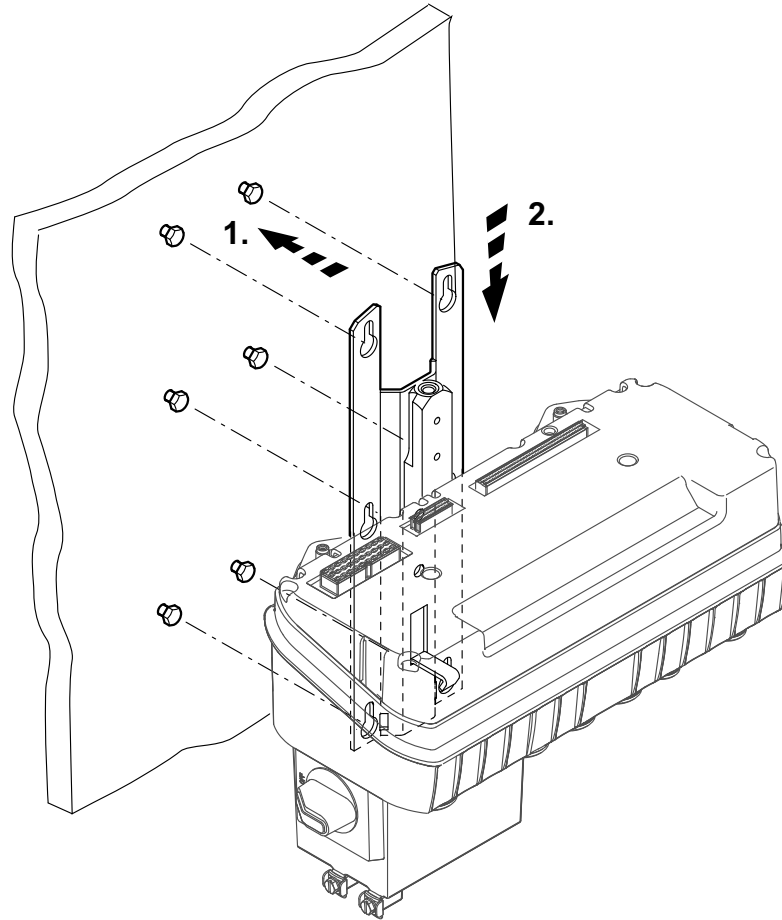


min.
4 x M6

758550411



3. Hang the ABOX with the mounting rail into the screws.



3045024523



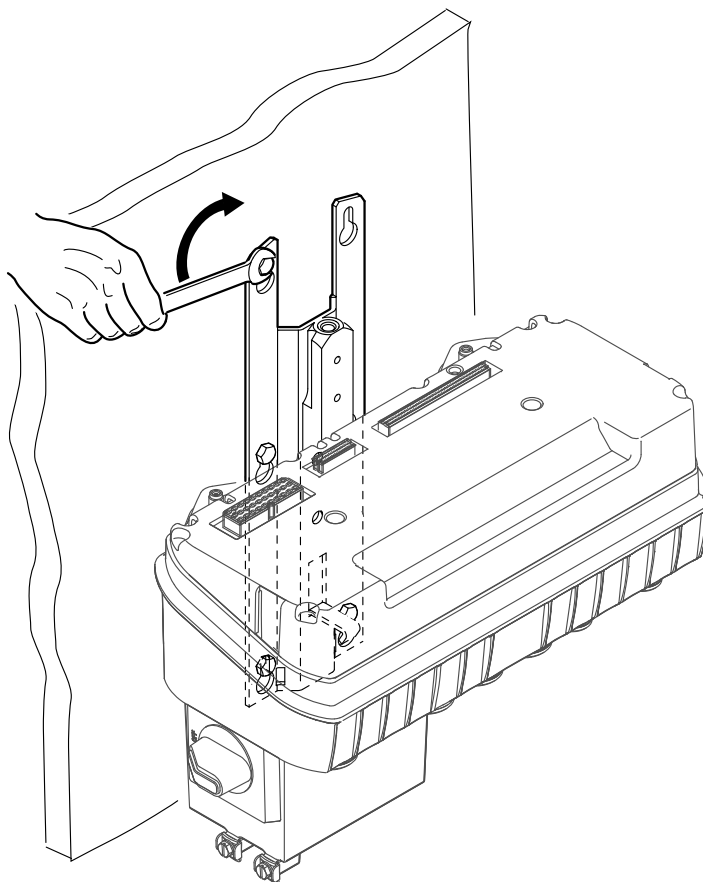
Mechanical Installation Mounting

4. Tighten the screws.

▲ CAUTION Risk of injury if the load falls.

Minor injuries

- Tighten at least 4 wall screws to ensure a secure fit after mounting.



3045189003



4.4 Central opening/closing mechanism



⚠ WARNING

Danger of burns due to hot surfaces of the MOVIFIT® unit.

Severe injuries.

- Do not touch the MOVIFIT® until it has cooled down sufficiently.



NOTICE

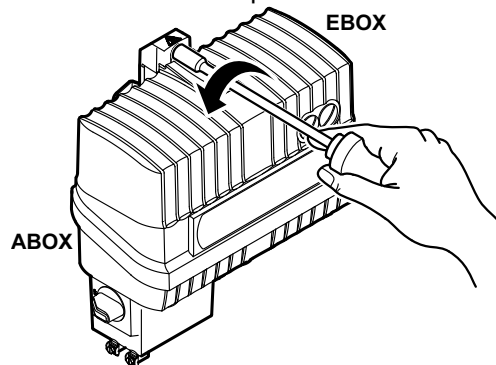
The enclosure specified in the technical data only applies when a unit is mounted correctly. MOVIFIT® can be damaged by moisture, dust or foreign particles when the EBOX is removed from the ABOX.

- Protect the ABOX and the EBOX when the unit is open.

4.4.1 Open

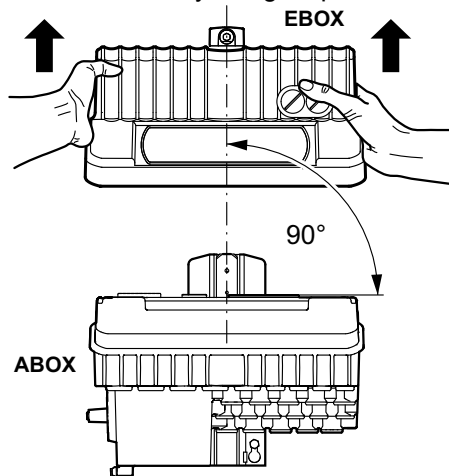
A socket wrench (SW8) is required for the central retaining screw.

1. Loosen the central retaining screw and continue to turn in counterclockwise direction until the EBOX does not move further up.



3041000331

2. Remove the EBOX from the ABOX by lifting it upwards. Do not twist the EBOX.



3041015691



Mechanical Installation

Central opening/closing mechanism

4.4.2 Closing

A socket wrench (SW8) is required for the central retaining screw.

1. **▲ NOTICE** An improperly seated gasket in the EBOX creates a strong counterforce when closing the MOVIFIT® unit.

The central opening/closing mechanism may be damaged as a result.

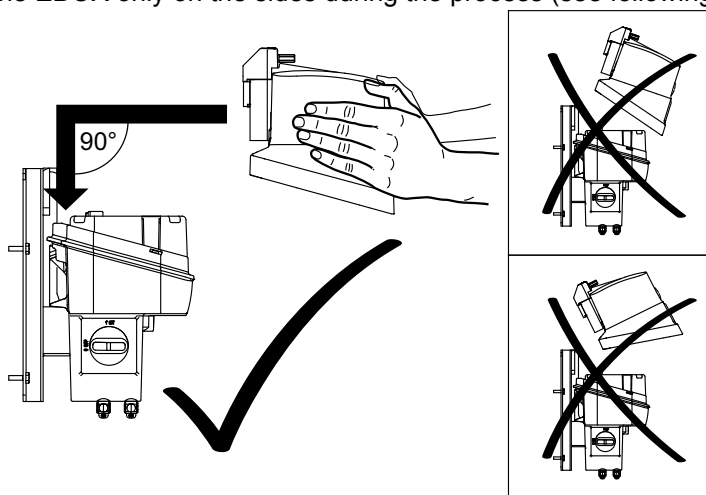
- Make sure that the gasket is properly seated in the groove of the EBOX.

This means that

- the gasket is inserted into the groove over the entire circumference
- and does not protrude from the groove.

2. Position the EBOX on the ABOX.

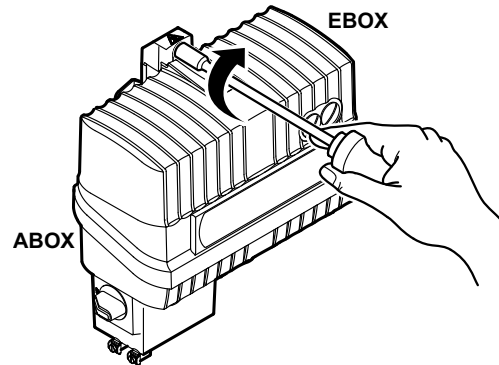
- Do not twist the EBOX in the process.
- Hold the EBOX only on the sides during the process (see following picture).



3041013771



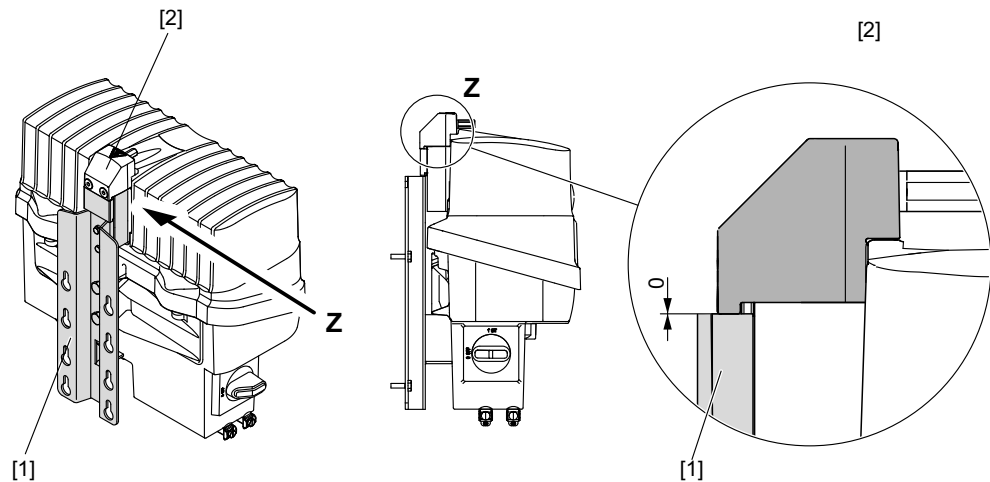
3. Tighten the retaining screw up to the stop using a tightening torque of 7 Nm (60 lb.in).



3041029131

▲ NOTICE If the torque is too high, the central opening/closing mechanism can be destroyed.

- Tighten the retaining screw with a maximum tightening torque of 7 Nm (60 lb.in).
 - If there is a noticeable counter torque, remove the EBOX again and check to see that the gasket is seated properly. If necessary, press the gasket firmly into the groove.
 - Never tighten the retaining screws with impermissibly high tightening torques.
4. MOVIFIT® is properly closed when the redirector of the closing mechanism [2] touches the mounting plate [1].



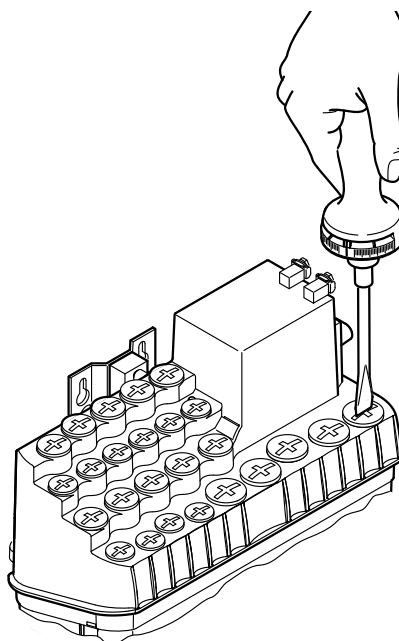
3041023371



4.5 Tightening torques

4.5.1 Blanking plugs

Tighten the blanking plugs included in the delivery of SEW-EURODRIVE with a tightening torque of 2.5 Nm (22 lb.in):

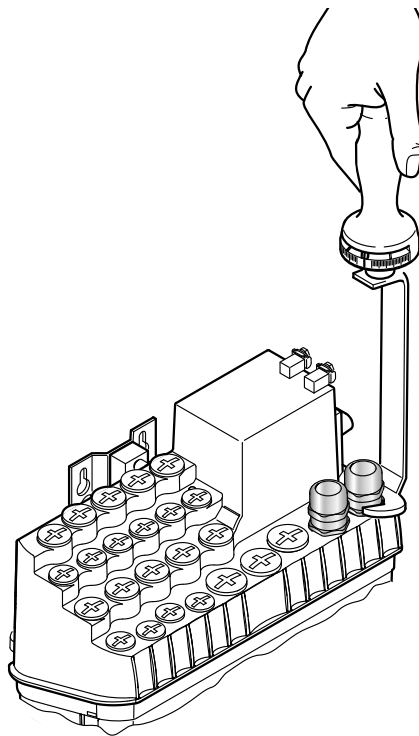


758614667



4.5.2 EMC cable glands

Tighten the EMC cable glands optionally included in the delivery with the following tightening torques:



758624523

Screw fitting	Part number	Size	Tightening torque
EMC cable glands (nickel-plated brass)	1 820 478 3	M16x1.5	3.5 to 4.5 Nm (31 – 40 lb.in)
	1 820 479 1	M20x1.5	5.0 to 6.5 Nm (44 – 57 lb.in)
	1 820 480 5	M25x1.5	6.0 to 7.5 Nm (53 – 66 lb.in)
EMC cable glands (stainless steel)	1 821 636 6	M16x1.5	3.5 to 4.5 Nm (31 – 40 lb.in)
	1 821 637 4	M20x1.5	5.0 to 6.5 Nm (44 – 57 lb.in)
	1 821 638 2	M25x1.5	6.0 to 7.5 Nm (53 – 66 lb.in)

The cable retention in the cable gland must withstand the following removal force of the cable from the cable gland:

- Cable with outer diameter > 10 mm: ≥ 160 N
- Cable with outer diameter < 10 mm: = 100 N



4.6 MOVIFIT® FDC version for wet areas



INFORMATION

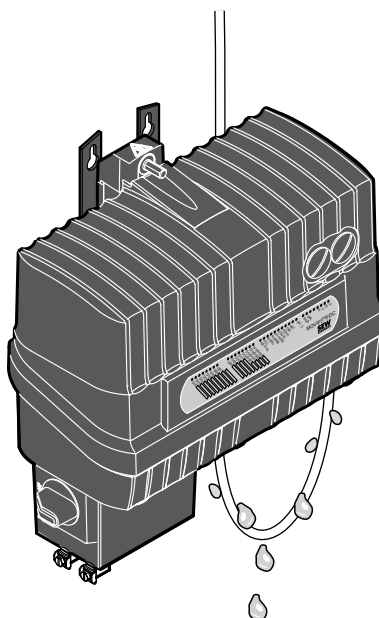
SEW-EURODRIVE guarantees that the specially treated surface is free from flaws. Report any transport damage immediately.

Although the housing surfaces have a high impact resistance, they are to be handled with care. The corrosion protection can be affected by damages as a result from improper handling during transport, installation, operation, cleaning, etc. SEW-EURODRIVE is not liable for such damage.

4.6.1 Installation notes

Observe the following additional notes when installing MOVIFIT® FDC for use in wet areas:

- Make sure to prevent moisture and dirt from entering the unit during installation.
- After electrical installation and during assembly, check for damaged seals and sealing surfaces.
- Check the state of the profile seal in the EBOX when performing maintenance. If damaged: Consult SEW-EURODRIVE.
- When using the version for wet areas, SEW-EURODRIVE recommends that you replace the plastic screw plugs delivered as standard with suitable stainless steel screws (page 110).
- Note the permitted mounting position (page 23).
- Make sure to install the cable with a drip loop; see the following figure:



4234193419



4.6.2 Tightening torques for the version for wet areas



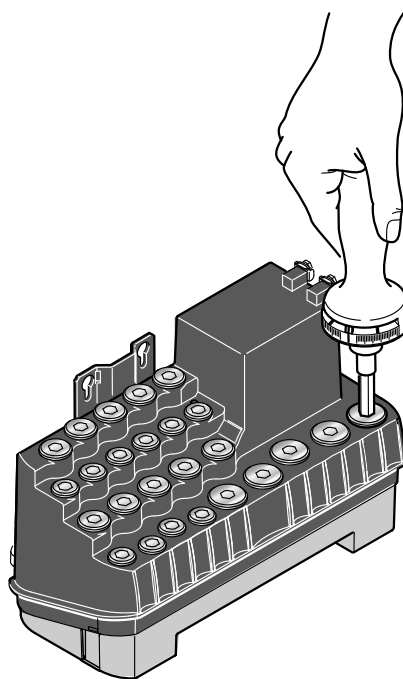
INFORMATION

When using the version for wet areas, replace the plastic screw plugs delivered as standard with suitable stainless steel screws.

Refer to chapter "Options and accessories" (page 110) for screw plugs available from SEW-EURODRIVE.

Screw plugs

Tighten the screw plugs optionally supplied by SEW-EURODRIVE to 2.5 Nm (22 lb.in).



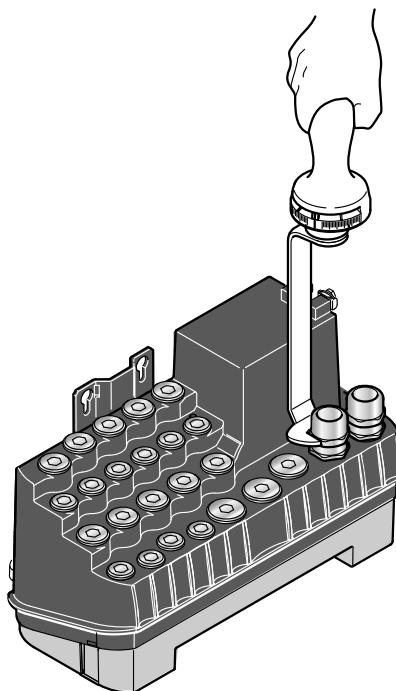
512774539



Mechanical Installation

MOVIFIT® FDC version for wet areas

EMC cable glands Tighten the EMC cable glands optionally supplied by SEW-EURODRIVE to the following torques:



512772875

Screw fitting	Part number	Size	Tightening torque
EMC cable glands (nickel-plated brass)	1820 478 3	M16 x 1.5	3.0 Nm to 4.0 Nm (26 – 35 lb.in)
	1820 479 1	M20 x 1.5	3.5 Nm to 5.0 Nm (31 – 44 lb.in)
	1820 480 5	M25 x 1.5	4.0 Nm to 5.5 Nm (35 – 49 lb.in)
EMC cable glands (stainless steel)	1821 636 6	M16 x 1.5	3.5 Nm to 4.5 Nm (31 – 40 lb.in)
	1821 637 4	M20 x 1.5	5.0 Nm to 6.5 Nm (44 – 57 lb.in)
	1821 638 2	M25 x 1.5	6.0 Nm to 7.5 Nm (53 – 66 lb.in)

The cable retention in the cable gland must withstand the following removal force of the cable from the cable gland:

- Cable with outer diameter > 10 mm: ≥ 160 N
- Cable with outer diameter < 10 mm: $= 100$ N



5 Electrical Installation

5.1 General information

Observe the following notes on electrical installation:

- Observe the general safety notes.
- Strictly observe all instructions as to the technical data and the permissible conditions regarding the place of installation.
- Use suitable screw fittings for the cables (use reducing adapters if necessary). With connector plug versions, you must use a suitable mating connector.
- Seal open cable entries with screw plugs.
- Use protective caps to seal plug connectors not in use.

5.2 Installation planning taking EMC aspects into account



INFORMATION

This drive system is not designed for operation on a public low voltage supply system that supplies residential areas.

MOVIFIT[®] units can cause EMC interference within the permitted limit range according to DIN EN 61800-3. In this case, it is recommended for the operator to take suitable measures.

For detailed information on EMC compliant installation, refer to the SEW publication Drive Engineering – Practical Implementation, "Electromagnetic Compatibility in Drive Engineering".

Successful installation of decentralized drives depends on selecting the correct cables, providing correct grounding and a functioning equipotential bonding.

Always apply the **relevant standards**.

Note the following:

5.2.1 Line filter

The NF.. line filter is used to suppress interference emission on the line side.

Do not switch between NF.. line filter and MOVIFIT[®] FDC.

NF.. line filters have an independent cRUus approval.

The following line filters are available:

Line filter type	Part number
NF018-503	0 827 413 4
NF035-503	0 827 128 3
NF048-503	0 827 117 8
NF063-503	0 827 414 2

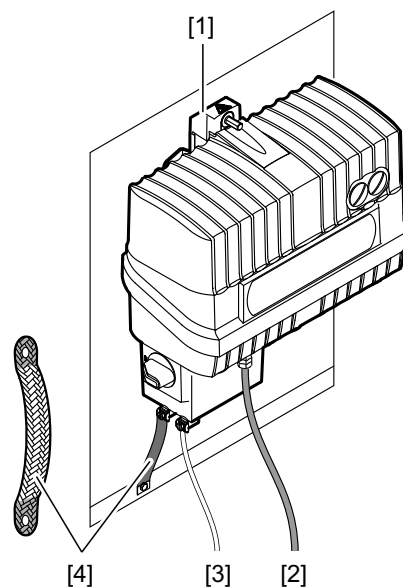


5.2.2 Equipotential bonding

Regardless of the protective earth connection, it is essential that low-impedance, **HF-capable equipotential bonding** is provided (see also VDE 0113 or VDE 0100 part 540):

- Establish a connection over a wide surface area between the MOVIFIT® mounting rail and the system.
(Untreated, unpainted, uncoated mounting surface.)
- To do so, use a ground strap (HF litz wire) to connect MOVIFIT® and the system's grounding point.

- [1] Conductive connection over a large area between MOVIFIT® and the mounting rail
- [2] PE conductor in the supply cable
- [3] 2nd PE conductor via separate terminals
- [4] EMC-compliant equipotential bonding, for example using a ground strap (HF litz wire)



9007202295768203

- Do not use the cable shield of data lines for equipotential bonding.



5.2.3 Data lines and 24 V supply

Route data lines and 24 V supply separately from cables that emit interference (such as control cables of solenoid valves, motor cables).

5.2.4 Connection between MOVIFIT[®] FDC and the MOVIGEAR[®] and DRC drive units

Use only the following cables to connect MOVIFIT[®] FDC with the MOVIGEAR[®] and DRC drive units:

- Prefabricated SNI cable,
see chapter "Electrical connections" / X8: AC 400 V output (SNI)"
- SNI cable with open ends,
see chapter "Technical Data" / "Specified connection cables for single-line installation"
- Prefabricated hybrid cables,
see chapter "Electrical connections" / X8: 400 V output and CAN bus"
- Hybrid cable with open ends,
see chapter "Recommended hybrid cables"

5.2.5 Cable shields

- Must have good EMC properties (high shield attenuation)
- May not serve only as mechanical protection for the cable.
- Must be connected to a wide area of the unit's metal housing at the cable ends, see also chapter "Connecting the SNI cable" (page 52) or chapter "Connecting the hybrid cable with CAN bus" (page 53).



5.3 Installation instructions (all versions)

5.3.1 Connecting supply system leads

- The rated voltage and frequency of MOVIFIT® FDC and the connected MOVIGEAR® and DRC drive units must correspond to the data of the supply system.
- Cable cross section: At least corresponding to the total current of the connected MOVIGEAR® and DRC drive units, but maximally 10 mm².
- Install line fuses at the beginning of the supply system line behind the supply bus junction. Use D, D0, NH fuses or circuit breakers. Select the fuse size according to the cable cross section.
- MOVIGEAR® FDC is suitable for operation on voltage supply systems with grounded star point (TN and TT systems).

5.3.2 Residual current device

- SEW-EURODRIVE recommends that you do not use RCDs. However, if a residual current device is stipulated for direct or indirect protection against contact, observe the following note in accordance with EN 61800-5-1:

▲ CAUTION Electric shock due to incorrect RCD type.

Severe or fatal injuries.

- The connected MOVIGEAR® and DRC drive units can cause direct current in the protective earth conductor. In cases where a residual current device is used for protection against direct or indirect contact, only a residual current device type B is permitted on the external power supply side of MOVIGEAR® and DRC drive units.
- Do not use a conventional RCD as a protective device. Universal current-sensitive RCDs (tripping current 300 mA) are permitted as a protective device. Earth-leakage currents \geq AC 3.5 mA/DC 10 mA can occur during normal operation of MOVIGEAR® and DRC drive units.

5.3.3 Line contactor

- Use contactor switch contacts of utilization category AC-3 according to EN 60947-4-1 to connect the supply system cable.



5.3.4 Notes on PE connection and/or equipotential bonding

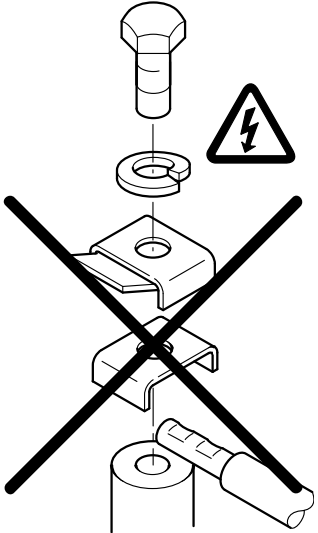
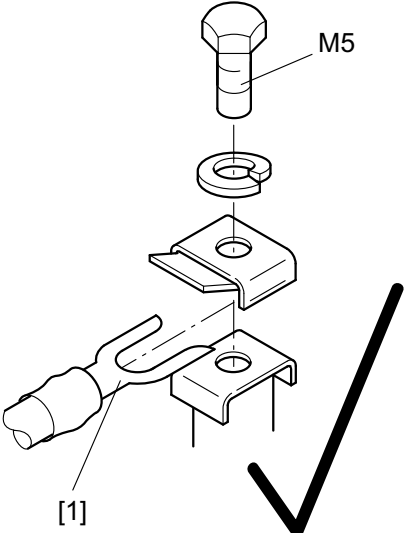
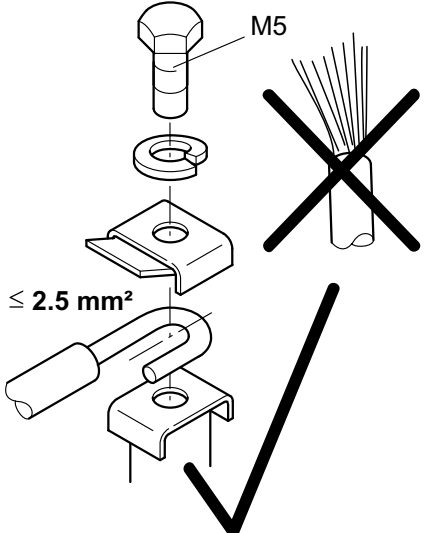


⚠ WARNING

Electric shock due to incorrect connection of PE.

Severe, fatal injuries

- The permitted tightening torque for the retaining screws is 2.0 – 2.4 Nm.
- Observe the following notes regarding the PE connection:

Prohibited assembly	Recommendation: Assembly with forked cable lug Permitted for all cross sections	Assembly with solid connecting wire Permitted for cross sections up to Max. 2.5 mm ²
 <p>323042443</p>	 <p>323034251</p>	 <p>323038347</p>

[1] Forked cable lug suitable for M5 PE screws

Earth-leakage currents ≥ 3.5 mA may occur during normal operation. To meet the requirements of EN 61800-5-1, observe the following notes:

- The protective earth (PE) connection must meet the requirements for plants with high earth-leakage currents.
- This usually means
 - installing a PE connection cable with a minimum cross section of 10 mm²
 - or installing a second PE connection cable in parallel with the original PE connection.



5.3.5 Definition PE, FE

- **PE** refers to the mains-side protective earth connection. The PE conductor in the mains connection cable may only be connected with terminals marked with "PE" (these are designed for the maximum permissible mains connection cross-section).
- **FE** refers to connections for "functional ground". You can connect any existing grounding conductor in the 24 V connection cable.

▲ WARNING Electric shock due to incorrect connection of PE to the terminals marked with "F" (functional ground). The FE connections are not designed for this purpose. This means electrical safety is not guaranteed.

Severe or fatal injuries.

- Connect the PE conductor in the mains connection cable only to terminals marked with "PE".

5.3.6 Installation altitude higher than 1000 m above sea level

MOVIFIT[®] FDC and the MOVIGEAR[®] and DRC drive units with supply voltages of 380 to 500 V can be used at altitudes above 1000 m asl up to a maximum of 4000 m asl under the following circumstances:

- The rated continuous power is reduced based on the reduced cooling above 1000 m (see "MOVIGEAR[®]" or "DRC" operating instructions).
- Above 2000 m above sea level, the air distances are only sufficient for overvoltage class 2. If installed at altitudes higher than 2000 m above sea level, you have to install additional external overvoltage protection to limit overvoltage peaks to 2.5 kV phase-to-phase and phase-to-ground.
- If safe electrical disconnection is required, it must be implemented outside the device at altitudes of more than 2000 m above sea level (safe electrical disconnection in accordance with EN 61800-5-1 and EN 60204-1).
- Up to 2000 m asl, the permitted nominal line voltage is 3 x 500 V. It is reduced by 6 V every 100 m to a maximum of 3 x 380 V at 4000 m asl.

5.3.7 Plug connectors

All MOVIFIT[®] plug connectors are illustrated in these operating instructions with view on the contact end.

5.3.8 Protection devices

- The connected MOVIGEAR[®] and DRC drive units are equipped with integrated protective overload devices, which means that external devices are no longer required.
- Line protection must be implemented up to MOVIFIT[®] FDC using external overload devices.
- For line protection between MOVIFIT[®] FDC and the MOVIGEAR[®] and DRC drive units from 2.5 mm², you can use the ABB MS325 motor protection switch integrated in MOVIFIT[®] FDC; factory set to 15 A for 2.5 mm², 20 A for 4.0 mm².
- Observe the relevant standards concerning cable cross section, voltage drop and installation type.

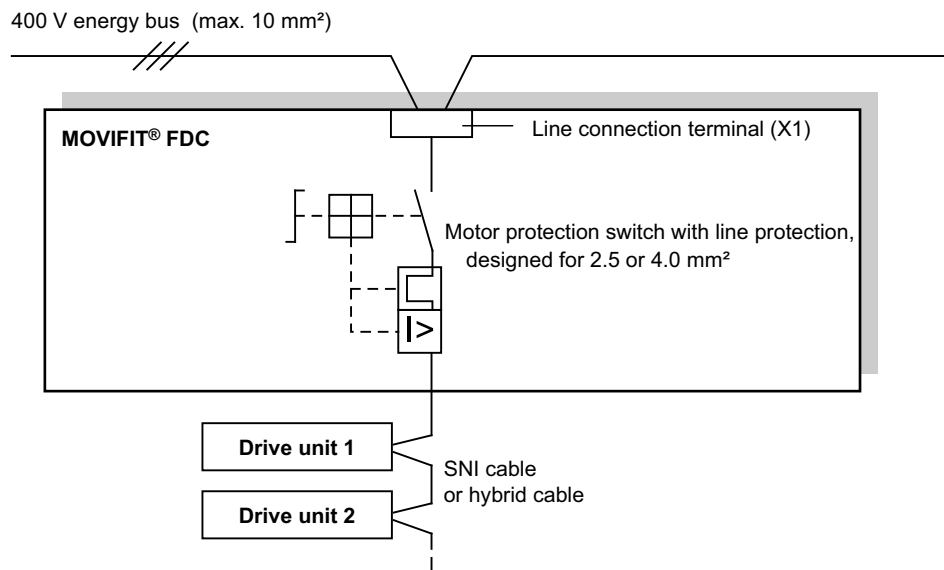


5.3.9 Power distribution and cable protection

MOVIFIT® FDC is equipped with integrated line protection for the supply cable to the MOVIGEAR® and DRC drive units. This line protection is provided by a type ABB MS325 motor protection switch integrated in the ABOX.

The type ABB MS325 motor protection switch protects the supply cable of the MOVIGEAR® and DRC drive units and is designed for a cable cross section of $4 \times 2.5 \text{ mm}^2$ (with factory setting: 15 A) or $4 \times 4.0 \text{ mm}^2$ (with factory setting 20 A).

Therefore, make sure during project planning that no more than 15 A or 20 A of total current runs through the connected MOVIGEAR® and DRC drive units. For UL-compliant installation, additional restrictions must be observed (see chapter "UL-compliant installation" (page 44).



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For power bus configuration, check to make sure that short-circuit and overload protection (in accordance with DIN VDE 0100-430) are still ensured for the supply system cables to the MOVIGEAR® and DRC drive units depending on line impedance, cable lengths and contact resistances.

Note the technical data and the characteristic curves of the motor protection switch. The data of ABB MS325 is available from ABB.



5.3.10 Information regarding UL

Note the following points for UL-compliant installation:

Line terminals

- Use only 75 °C copper wire.
- MOVIFIT® FDC uses cage clamp terminals.

Short circuit current rating

When installed in combination with the mentioned MOVIGEAR® and DRC drives:

Suitable for use in current circuits with a maximum short circuit current of 200 000 A_{eff}.
Max. voltage is limited to 500 V.

Branch circuit protection

The following table lists the maximum fuse rating.

Series	Max. fuse rating
MOVIFIT® FDC	40 A / 600 V

Ambient temperature

MOVIFIT® FDC is suitable for operation at an ambient temperature of 40 °C, max. 60 °C with derated output current.

The nominal input current is 40 A at 40 °C. To determine the input current rating at temperatures higher than 40 °C, the input current should be derated by 1.5% per °C between 40 °C and 60 °C.

The nominal output current is 15 or 20 A at 40 °C depending on the version. To determine the output current rating at temperatures higher than 40 °C, the output current should be derated by 3% per °C between 40 °C and 60 °C.

Wiring diagrams

You find the terminal and connector assignment for connecting MOVIFIT® FDC in chapter "Electrical Installation".

UL compliant installation

- For UL-compliant installation, only the EBOX specified on the ABOX nameplate may be mounted to the ABOX. UL certification refers only to the ABOX/EBOX combination stated on the nameplate.
- The standard variant of MOVIFIT® FDC is equipped with integrated, UL-approved short-circuit and ground fault protection for the supply cables to the MOVIGEAR® and DRC drive units. The protection device is set to 15 A or 20 A depending on the type.
- For MOVIFIT® FDC variants without integrated short-circuit and ground fault protection of the supply cables to the MOVIGEAR® and DRC drive units, you have to ensure this protection by suitable external measures.
- UL certification only applies to operation on voltage supply systems with voltages to ground of max. 300 V. The UL-certification does not apply to operation on voltage supply systems with a non-grounded star point (IT systems).



5.3.11 Additional installation instructions in connection with MOVIGEAR® / DRC SNI variant

Line connection Use a line filter and shielded cables for the line connection of MOVIFIT® FDC.

24 V connection Use shielded cables for connecting the 24 V supply of MOVIFIT® FDC.

SNI connection Use only the following cables to connect the entire SNI line:

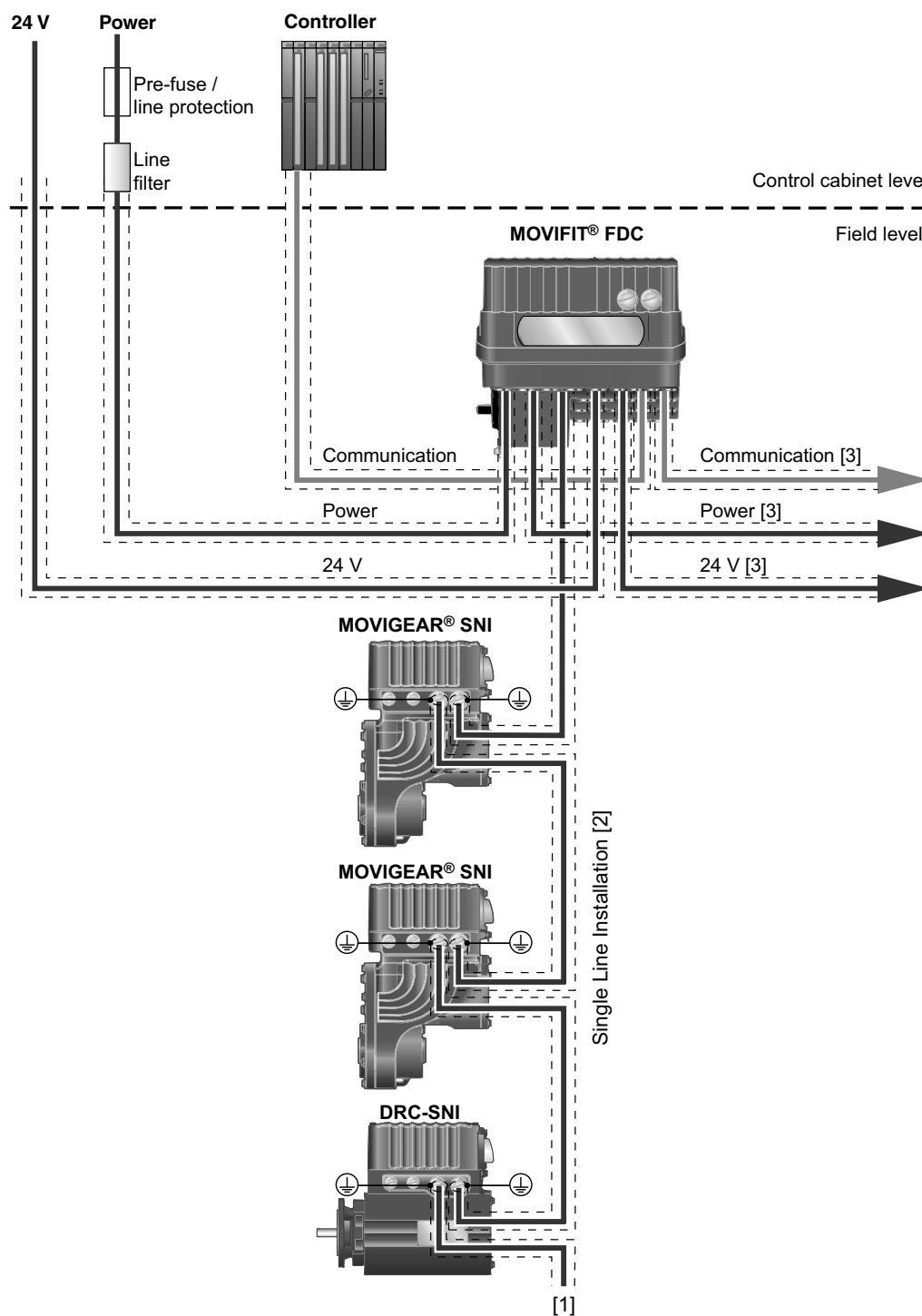
- Prefabricated SNI cables
see chapter "Electrical connections" / X8: 400 V output (SNI)
- SNI cable with open ends
see chapter "Technical Data" / "Specified connection cables for single-line installation"

You find an example of the installation topology for SNI in chapter "Installation topologies" / "Installation topology SNI (example)"

5.4 Installation topologies

5.4.1 Installation topology SNI (example)

The following figure shows the basic installation topology of MOVIFIT® FDC in conjunction with MOVIGEAR® SNI and DRC-SNI drive units:



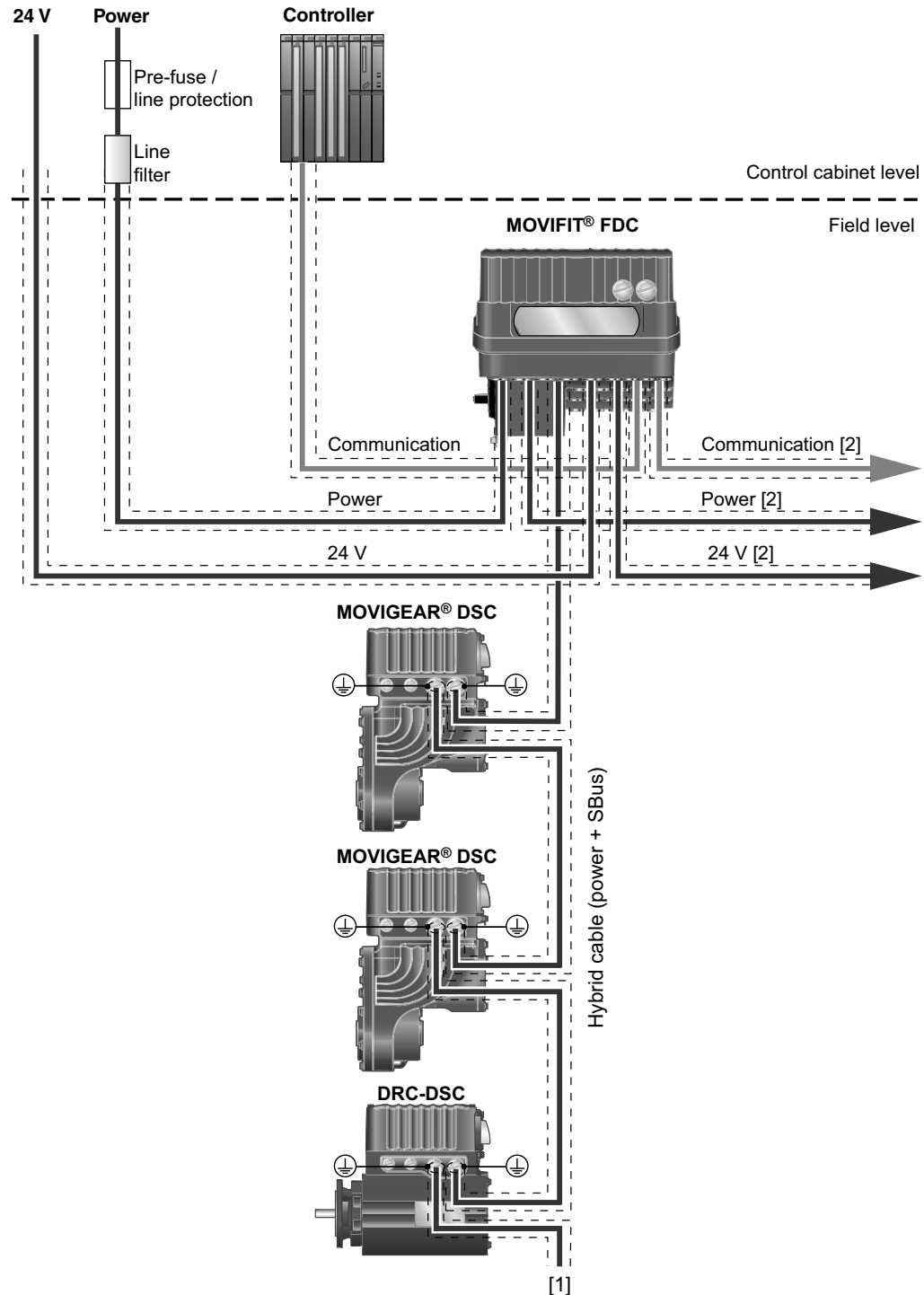
18014401517353867

- [1] Max. 10 x drive units (MOVIGEAR® SNI or DRC-SNI) in total
- [2] Permitted cable length between MOVIFIT® and last drive unit max. 100 m
- [3] Looping through the communication, the power supply and the 24 V supply is only permitted when using the standard ABOX MTA...-S04-.... Looping through is in preparation for ABOXes MTA...-S54-... and MTA...-S64-....



5.4.2 Installation topology SBus (example)

The following figure shows the basic SBus installation topology of MOVIFIT® FDC in conjunction with MOVIGEAR® DSC and DRC-DSC drive units:



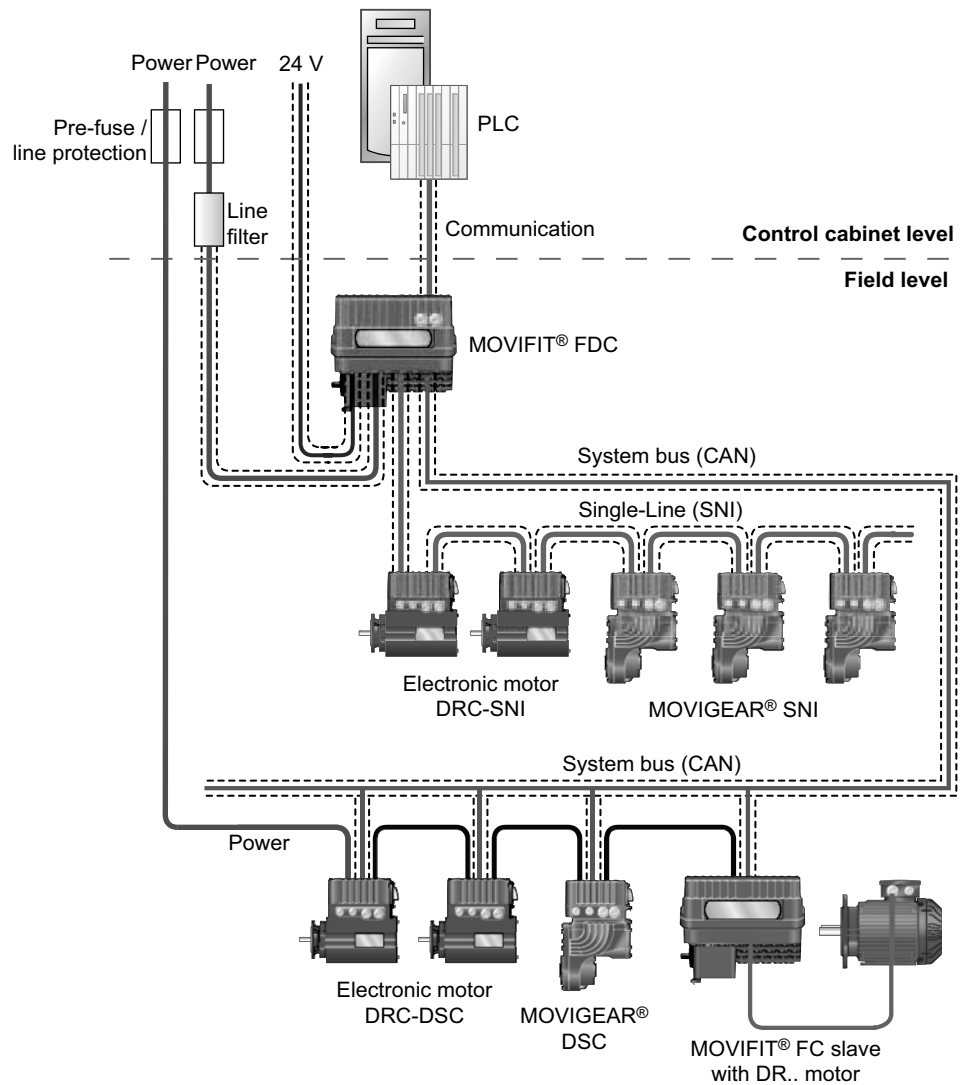
5595276683

- [1] Permitted cable length between MOVIFIT® and last drive unit when using the recommended hybrid cable:
- 1 MBaud: 25 m
 - 500 kBd: 50 m
- [2] Looping through the communication, the power supply and the 24 V supply is only permitted when using the standard ABOX MTA...-S04-... Looping through is in preparation for ABOXes MTA...-S54-... and MTA...-S64-...



5.4.3 Combined installation topology

The following figure shows a combined topology with single line network and SBus installation:



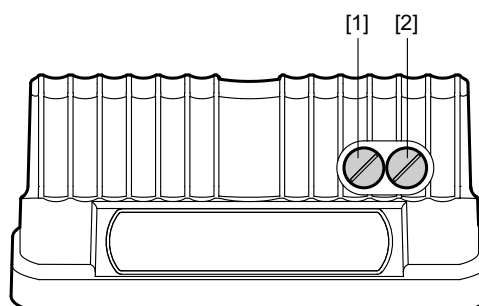
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5.5 EBOX "MTC...-R9...-00"

5.5.1 Plug connector positions

The following figure depicts the EBOX "MTC...-R9...-00":



3041021451

[1] X51	USB interface (underneath the screw plug)	USB socket type B
[2] X52	Ethernet service interface (underneath the screw fitting)	RJ45

You find the pin assignment of the plug connectors in the "Electrical Connections" chapter.

Important! The degree of protection specified under technical data only applies if the screw plugs of the USB and Ethernet service interface are properly installed.

Missing or incorrectly installed screw plugs can cause damage to the MOVIFIT® FDC unit.

- Once you have finished working on the MOVIFIT® FDC unit, check for proper installation of the screw plugs of the USB and Ethernet service interfaces.
- For closing the USB and Ethernet service interface, use only screw plugs with part number 1 813 0623.



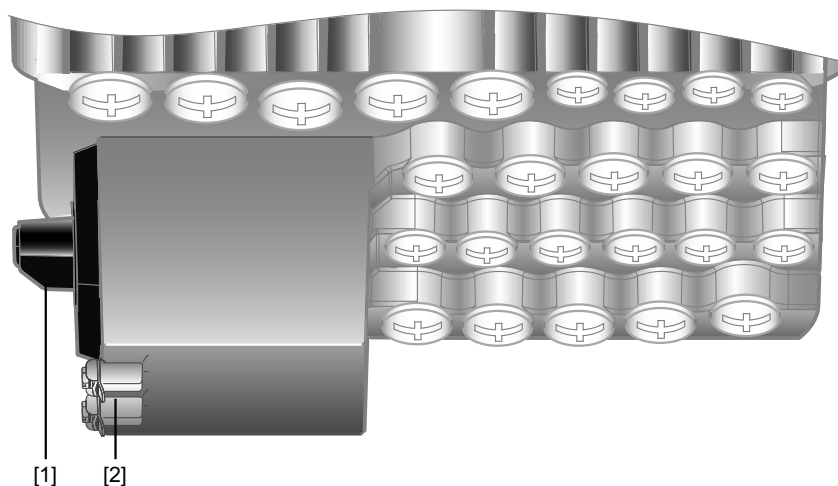
Electrical Installation

Standard ABOX "MTA...-S04.-...-00"

5.6 Standard ABOX "MTA...-S04.-...-00"

5.6.1 Description

The following figure depicts the standard ABOX "MTA...-S04.-...-00" with terminals and cable bushings:



3045820427

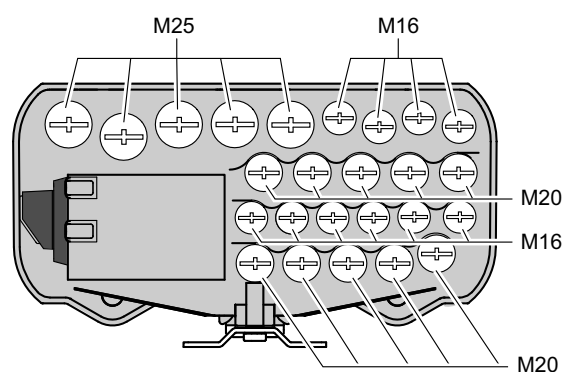
[1] Maintenance switch

[2] PE connection

5.6.2 Screw fittings

The following figure depicts the screw fittings of the standard ABOX:

PROFINET MTA11A-503-S043-...-00
EtherNet/IP MTA11A-503-S043-...-00
Modbus/TCP MTA11A-503-S043-...-00



27021600809749131

*) Communication via EtherNet/IP and Modbus/TCP is in preparation.



5.6.3 Additional installation instructions for "MTA...-S04.-...-00"

Permitted connection cross-section and current carrying capacity of the terminals

During installation, observe the permitted cable cross sections of the MOVIFIT® FDC terminals:

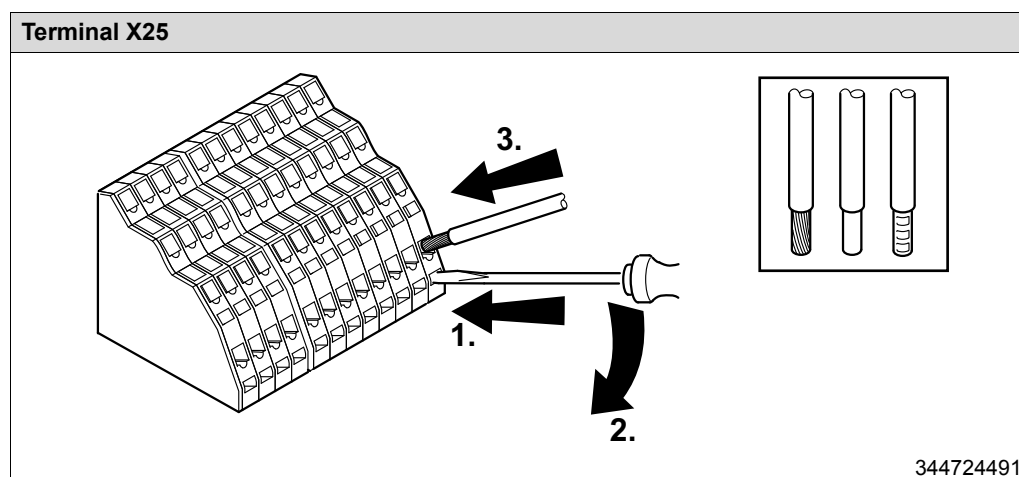
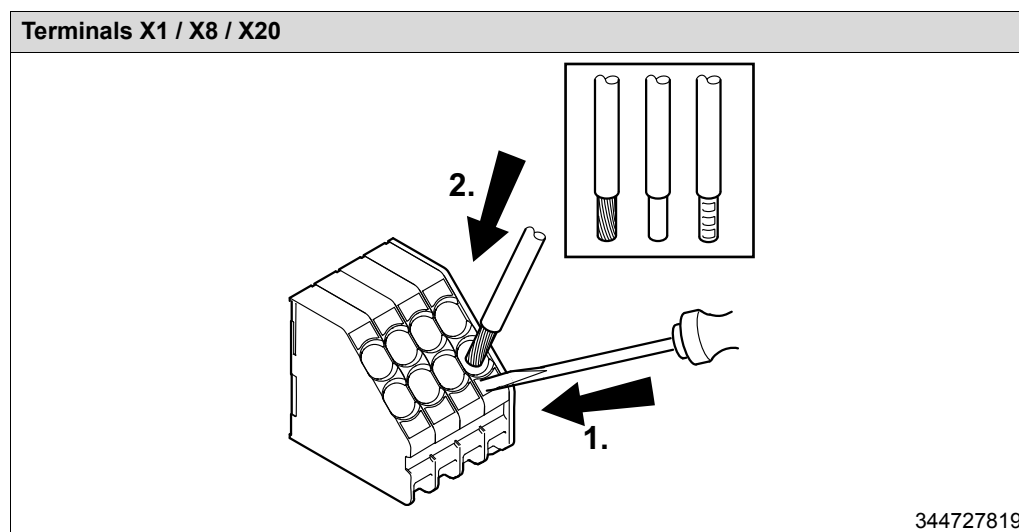
Terminal data	X1 ¹⁾ Supply sys- tem cable	X20 External 24 V supply	X25 ¹⁾ I/O terminals	X8 ¹⁾ Terminal MOVIGEAR® / DRC
Connection cross section	0.2 mm ² – 10 mm ²	0.2 mm ² – 6 mm ²	0.08 mm ² – 2.5 mm ²	0.2 mm ² – 6 mm ²
	AWG 24 – AWG 8	AWG 24 – AWG 10	AWG 28 – AWG 14	AWG 24 – AWG 10
Current carrying capacity (max. con- tinuous current) ²⁾	40 A	16 A	150 mA per sensor connection Total current 1.5 A	20 A
			500 mA per binary output Total current 2.0 A	

1) When using conductor end sleeves, the permitted cross section is reduced by one unit (e.g. 2.5 mm² to 1.5 mm²)

2) The current carrying capacity indicates the value for the entire current path.

Activating terminals

Note the following information for actuating the terminals:



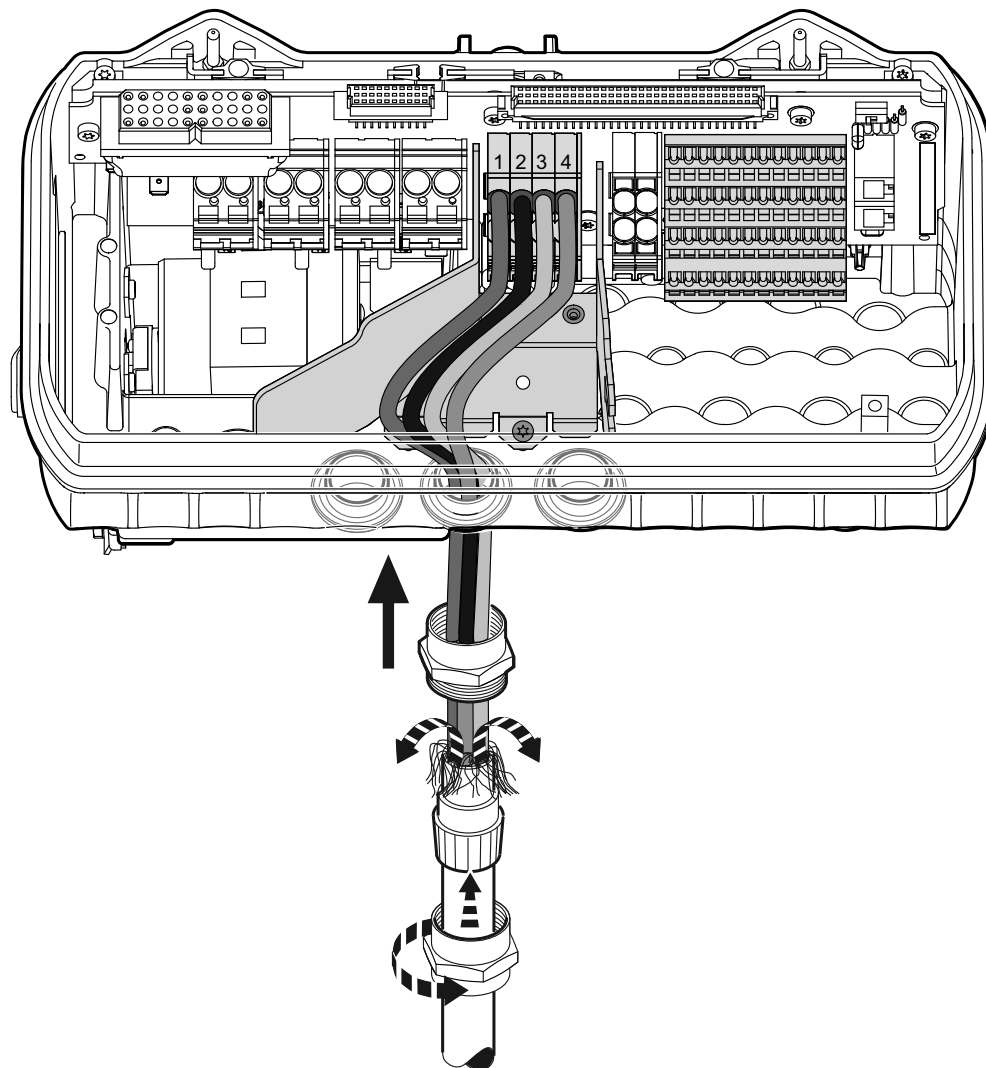


Electrical Installation

Standard ABOX "MTA...-S04.-...-00"

Connecting the SNI cable

- SEW-EURODRIVE recommends using the appropriately stripped and prefabricated SNI cables specifically designed for connecting MOVIFIT® FDC with the SNI actuators (MOVIGEAR® SNI or DRC-SNI).
- The cable shield of the SNI cable must be applied to the MOVIFIT® ABOX as follows using an EMC cable gland:

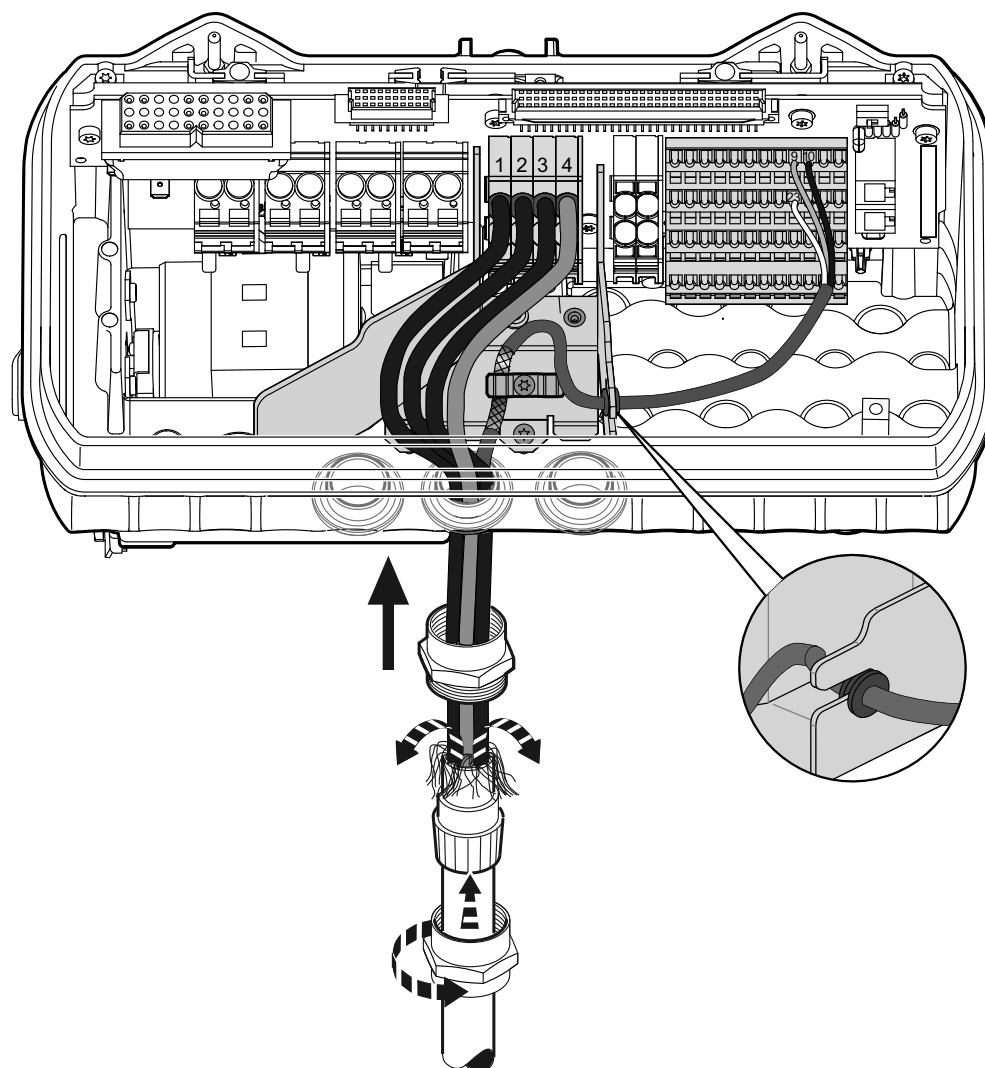


9007202380805131



*Connecting the
hybrid cable with
CAN bus*

- SEW-EURODRIVE recommends using the appropriately stripped and prefabricated hybrid cables specifically designed for connecting MOVIFIT® FDC with the SBus actuators (MOVIGEAR® DSC or DRC-DSC).
- The outer cable shield of the hybrid cable must be applied to the MOVIFIT® ABOX as follows using an EMC cable gland:
- The inner cable shield of the CAN cable in the hybrid cable must be applied to the shield plate of the MOVIFIT® ABOX as follows using a clamp:



5595708811

NOTICE

Damage due to missing or incorrectly mounted rubber grommet

Damage to the CAN cable

- During installation, make sure the CAN cable is protected with a rubber grommet where it passes through the shield plate (see above figure).
- Push the CAN cable with the rubber grommet in the recess of the shield plate entirely to the back and then slightly downward.



5.6.4 Terminal assignment

**⚠ WARNING**

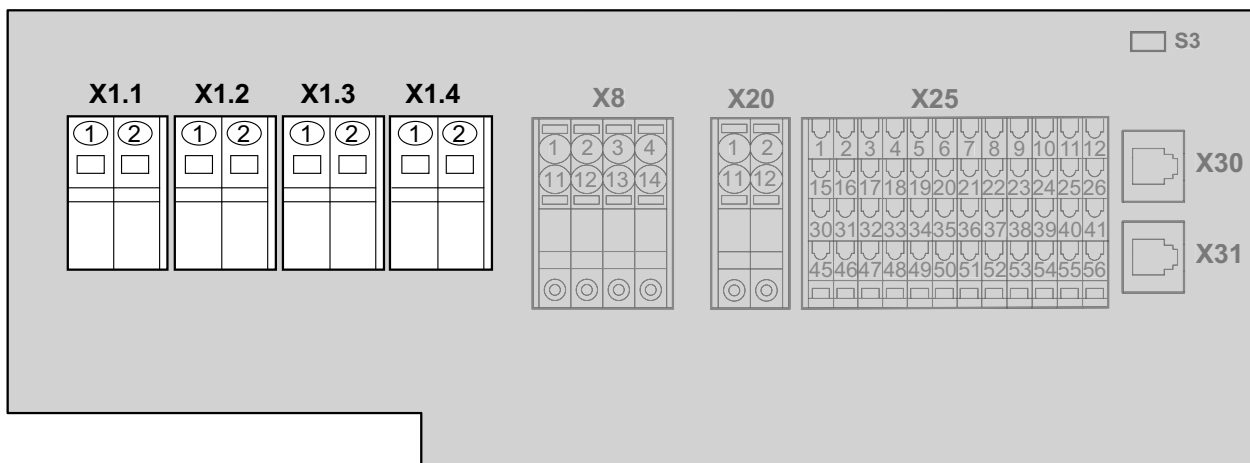
Electric shock due to dangerous voltages present in the ABOX.

The maintenance switch disconnects only the connected MOVIGEAR® and DRC drive units from the power supply system. Voltage is still present on the X1 terminals of MOVIFIT® FDC. Voltage is still present on the X8 terminals for up to 5 minutes after having actuated the maintenance switch.

Severe or fatal injuries.

- Switch off the power to MOVIFIT® FDC using a suitable external disconnecting device, and wait at least 5 minutes before opening the wiring space.

X1: Line terminals (power bus)

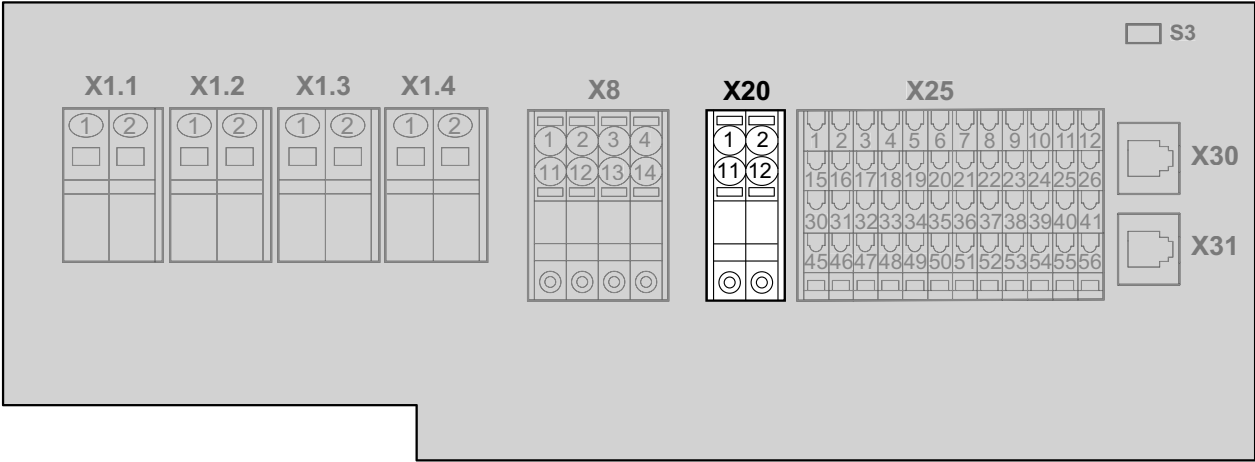


3010522635

Line terminal (power bus)			
No.		Name	Function
X1.1	1	L1	Supply system phase 1 (IN)
	2	Res.	Reserved
X1.2	1	L2	Supply system phase 2 (IN)
	2	Res.	Reserved
X1.3	1	L3	Supply system phase 3 (IN)
	2	Res.	Reserved
X1.4	1	PE	PE connection (IN)
	2	Res.	Reserved



X20: 24 V supply terminal (24 V power bus)



3012877067

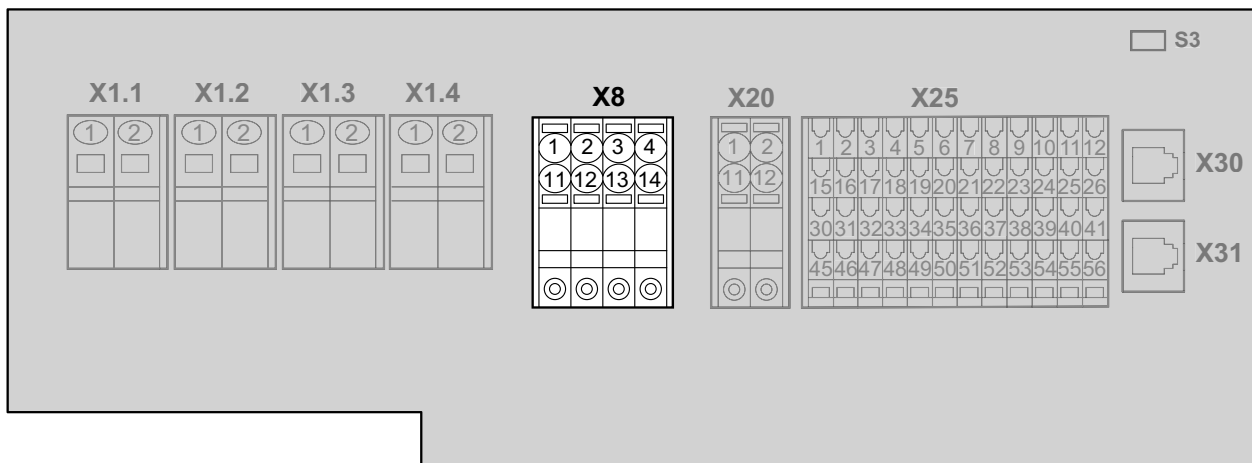
Terminal for external DC 24 V supply			
No.		Name	Function
X20	1	+24V	DC 24 V voltage (IN)
	2	0V24	0V24 reference potential for DC 24 V voltage (IN)
	11	Res.	Reserved
	12	Res.	Reserved



Electrical Installation

Standard ABOX "MTA...-S04.-...-00"

X8: Connecting terminals of SNI actuators (SNI cable)



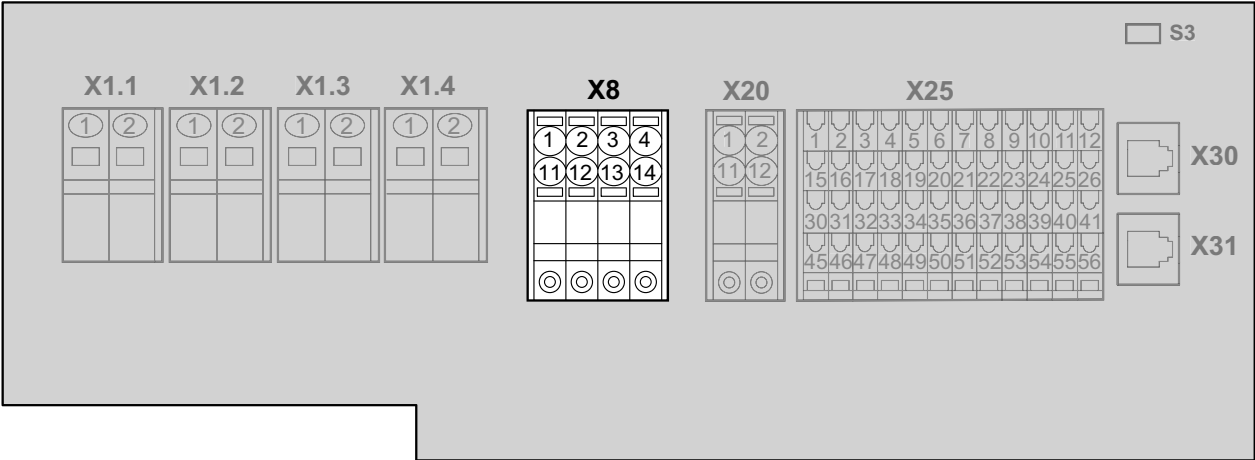
3012899979

Connecting terminals of SNI actuators (MOVIGEAR® SNI / DRC-SNI) (SNI cable)

No.		Name	Function
X8	1	L1_SNI	Actuator supply phase L1 with SNI communication
	2	L2_SNI	Actuator supply phase L2 with SNI communication
	3	L3_SNI	Actuator supply phase L3 with SNI communication
	4	PE	PE connection
	11	res.	Reserved
	12	res.	Reserved
	13	res.	Reserved
	14	res.	Reserved



X8: Connecting terminals SBus actuators (hybrid cable)



3012899979

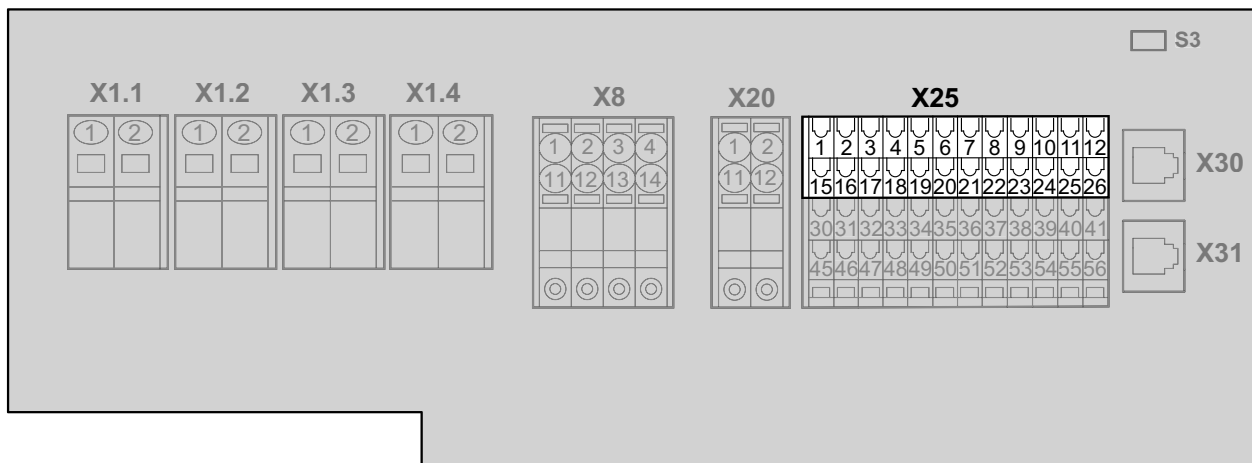
Connecting terminals SBus actuators (MOVIGEAR® DSC / DRC-DSC) (hybrid cable)			
No.		Name	Function
X8	1	L1	Actuator supply phase L 1
	2	L2	Actuator supply phase L2
	3	L3	Actuator supply phase L3
	4	PE	PE connection
	11	res.	Reserved
	12	res.	Reserved
	13	res.	Reserved
	14	res.	Reserved



Electrical Installation

Standard ABOX "MTA...-S04.-...-00"

X25: I/O SBus RS485 terminals



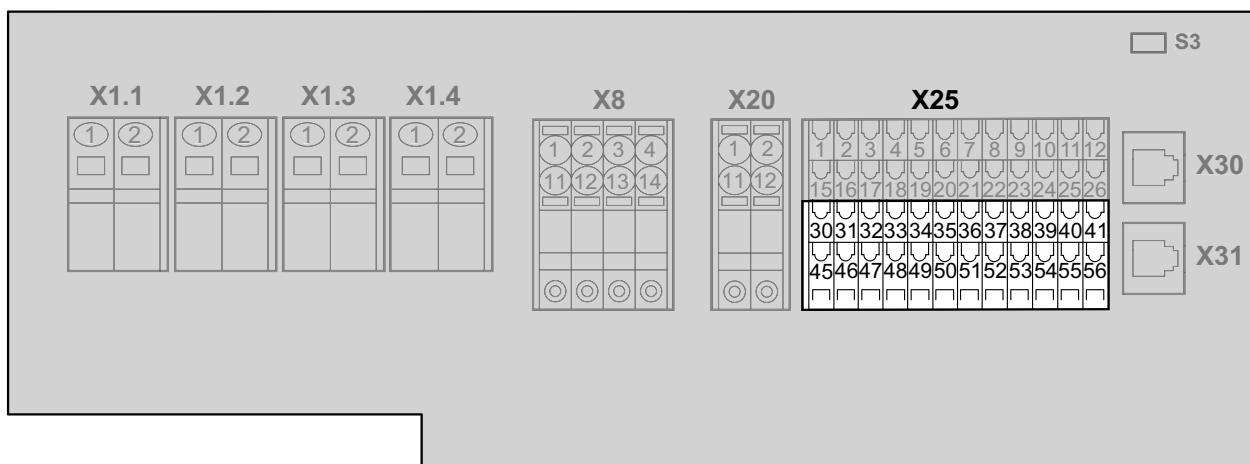
3012854923

I/O terminals (connection of sensors + actuators)

SBus terminal (CAN)

RS485 terminals

No.	Name	Function
X25	1	DI00 / DO00
	2	DI02 / DO02
	3	DI04
	4	DI06
	5	DI08
	6	DI10
	7	DI12
	8	DI14
	9	CAN_H
	10	CAN_GND
	11	RS+
	12	Res.
	15	DI01 / DO01
	16	DI03 / DO03
	17	DI05
	18	DI07
	[19]	DI09
	20	DI11
	21	DI13
	22	DI15
	23	CAN_L
	24	Res.
	25	RS-
	26	Res.



3121639051

I/O terminals (connection of sensors + actuators)

SBus terminal CAN

RS485 terminals

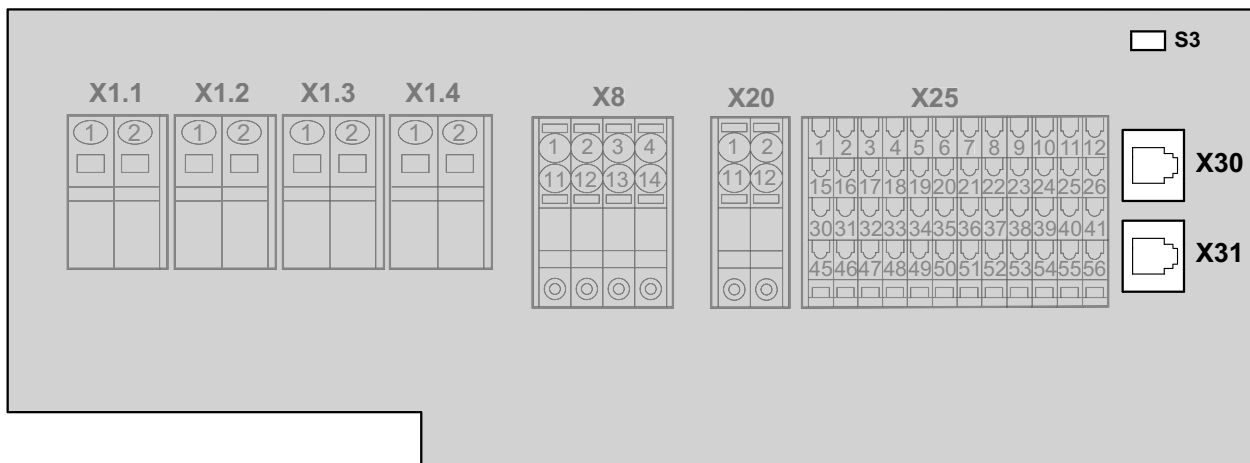
No.	Name	Function
X25	30	+24V
	31	+24V
	32	+24V
	33	+24V
	34	+24V
	35	+24V
	36	+24V
	37	+24V
	38	CAN_H
	39	CAN_GND
	40	+5V_CAN
	41	Res.
	45	GND
	46	GND
	47	GND
	48	GND
	49	GND
	50	GND
	51	GND
	52	GND
	53	CAN_L
	54	Res.
	55	Res.
	56	Res.



Electrical Installation

Standard ABOX "MTA...-S04.-...-00"

X30 and X31 Ethernet fieldbus plug connector

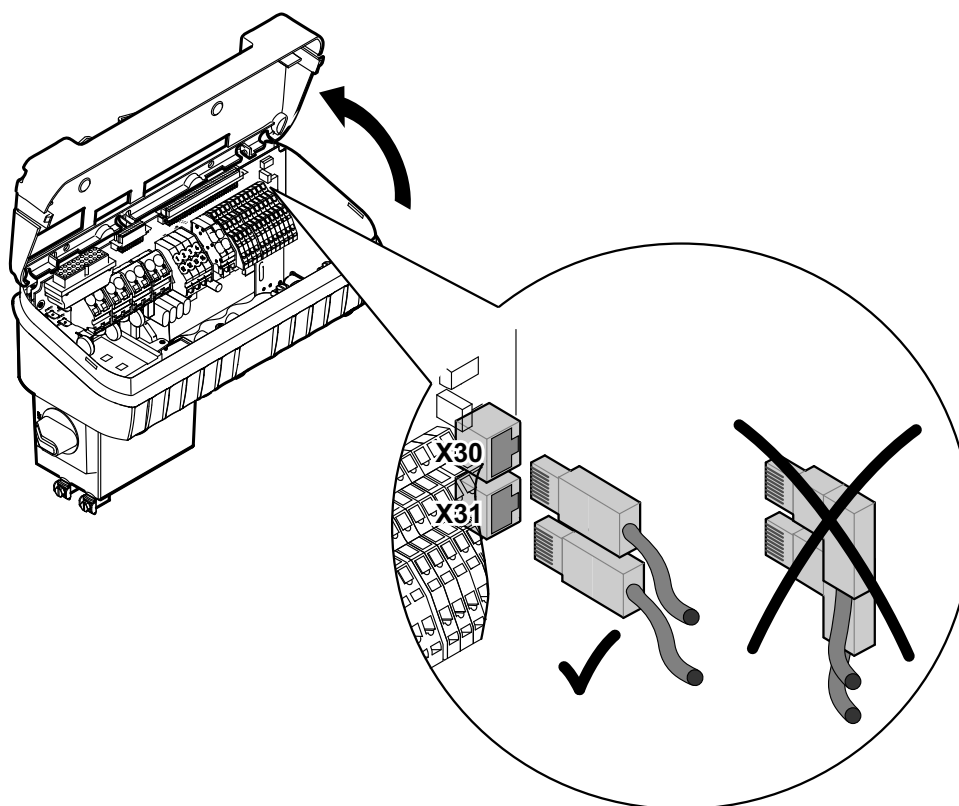


3012923659

Function				
Ethernet fieldbus plug connector				
<ul style="list-style-type: none"> • PROFINET IO • EtherNet/IP • Modbus/TCP 				
Connection type				
RJ45				
Wiring diagram				
2354433675				
Assignment				
No.		Name	Function	
X30	1	TX+	Transmit line (+)	Ethernet port 1
	2	TX-	Transmit line (-)	
	3	RX+	Receive line (+)	
	4	res.	Reserved	
	5	res.	Reserved	
	6	RX-	Receive line (-)	
	7	res.	Reserved	
	8	res.	Reserved	
X31	1	TX+	Transmit line (+)	Ethernet port 2
	2	TX-	Transmit line (-)	
	3	RX+	Receive line (+)	
	4	res.	Reserved	
	5	res.	Reserved	
	6	RX-	Receive line (-)	
	7	res.	Reserved	
	8	res.	Reserved	



The following figure shows the Ethernet connection in the ABOX:



3440787979



INFORMATION

Angular RJ45 connectors cannot be used to connect the Ethernet to plug connectors X30 and X31 (see above figure).



5.7 Hybrid ABOX "MTA...-S54.-...-00"

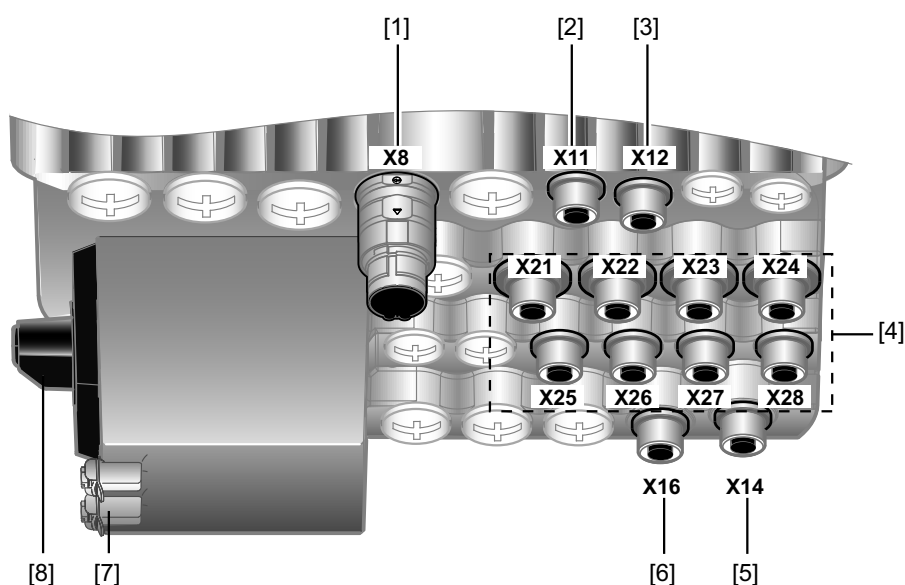


INFORMATION

- The hybrid ABOX is based on the standard ABOX "MTA...-S02.-...-00". You find the description of the additional plug connectors in comparison with the standard ABOX in the "Electrical Connections" chapter.
- For a description of the terminals, refer to chapter "Standard ABOX "MTA...-S02.-...-00" (page 50).
- Customers cannot use terminals X25 and the internal Ethernet plug connectors X30 and X31 because they are assigned the described plug connectors.

5.7.1 Description

The following figure depicts the hybrid ABOX with M12 plug connectors for connecting I/Os and bus:



9007202306223883

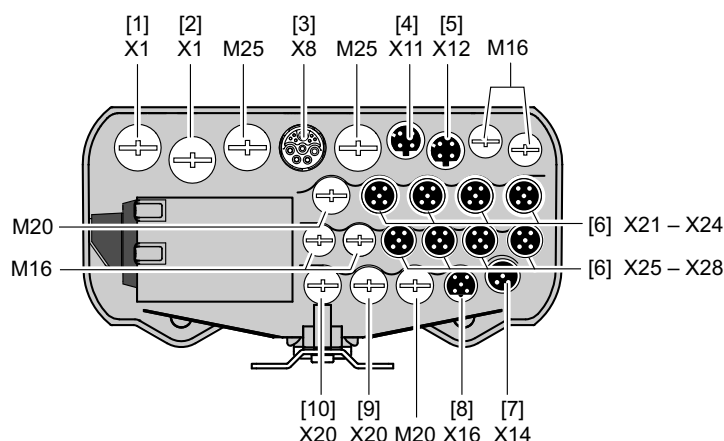
- | | | |
|-----|-----------|--|
| [1] | X8 | Drive unit connection |
| | | <ul style="list-style-type: none"> • AC 400 V output (SNI cable) • or AC 400 V output and CAN bus (hybrid cable) • or AC 400 V output |
| [2] | X11 | Ethernet fieldbus, port 1 |
| [3] | X12 | Ethernet fieldbus, port 2 |
| [4] | X21 – X28 | Binary inputs/outputs |
| [5] | X14 | SBus (CAN) – external |
| [6] | X16 | RS485 interface – external |
| [7] | | PE connection |
| [8] | | Maintenance switch |



5.7.2 Plug connector positions

The following figure shows the cable glands and plug connectors of the hybrid ABOX:

PROFINET MTA11A-503-S543-...-00
EtherNet/IP MTA11A-503-S543-...-00
Modbus/TCP MTA11A-503-S543-...-00



36028800070920715

[1]	X1	AC 400 V input	(terminals underneath the M25 gland)
[2]	X1	Reserved	(M25 gland)
[3]	X8	Drive unit connection	(M23 H-Tec, SEW P insert 15-pole, female)
		• AC 400 V output (SNI cable)	
		• or AC 400 V output and CAN bus (hybrid cable)	
		• or AC 400 V output	
[4]	X11	Ethernet fieldbus, port 1	(M12, 4-pole, female, D-coded)
[5]	X12	Ethernet fieldbus, port 2	(M12, 4-pole, female, D-coded)
[6]	X21 – X28	Binary inputs/outputs	(M12, 5-pole, female, A-coded)
[7]	X14	SBus (CAN) – external	(M12, 5-pole, female, A-coded)
[8]	X16	RS485 interface – external	(M12, 5-pole, female, B-coded)
[9]	X20	Reserved	(M20 gland)
[10]	X20	DC 24 V input	(terminals underneath the M20 gland)

You find the pin assignment of the plug connectors in the the "Electrical Connections" chapter.



5.8 Hybrid-ABOX "MTA...-S64.-...-00"

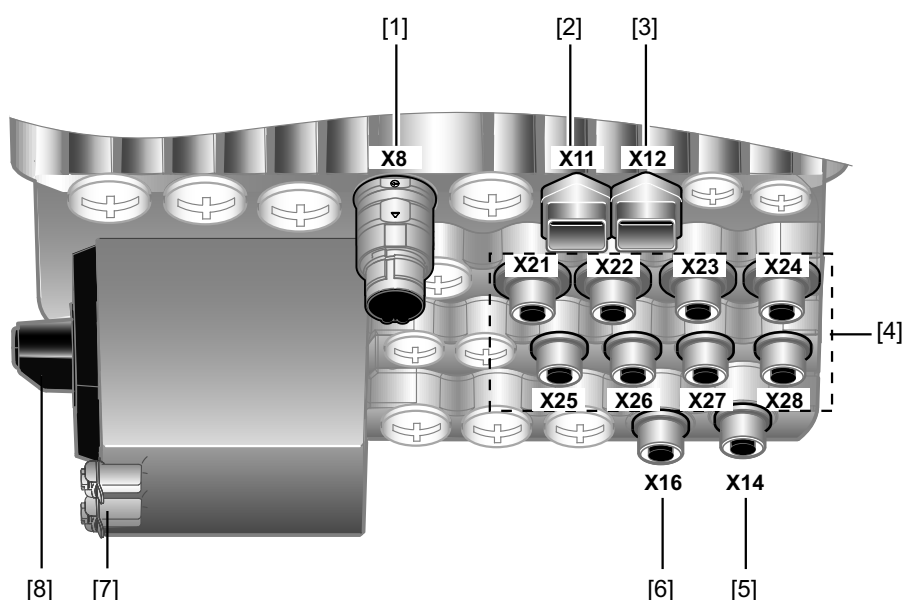


INFORMATION

- The hybrid ABOX is based on the standard ABOX "MTA...-S02.-...-00". You find the description of the additional plug connectors in comparison with the standard ABOX in the "Electrical Connections" chapter.
- For a description of the terminals, refer to chapter "Standard ABOX "MTA...-S02.-...-00" (page 50).
- Customers cannot use terminals X25 and the internal Ethernet plug connectors X30 and X31 because they are assigned the described plug connectors.

5.8.1 Description

The following figure shows the hybrid ABOX with M12 plug connectors for connecting I/Os and push-pull RJ45 plug connector for Ethernet connection:



9007202308003083

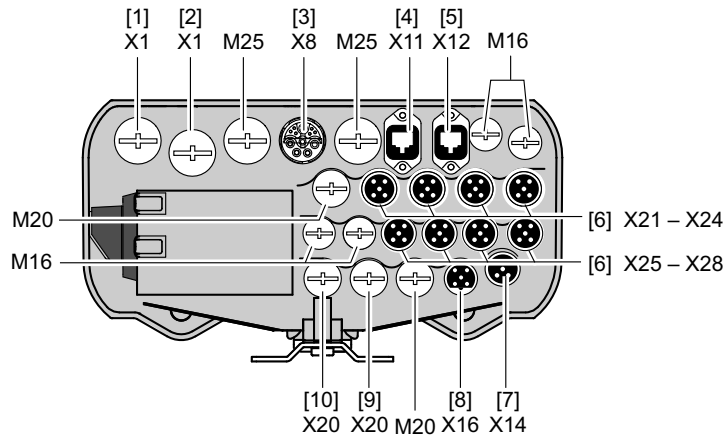
- | | | |
|-----|-----------|---|
| [1] | X8 | Drive unit connection |
| | | • AC 400 V output (SNI cable) |
| | | • or AC 400 V output and CAN bus (hybrid cable) |
| | | • or AC 400 V output |
| [2] | X11 | Ethernet fieldbus, port 1 |
| [3] | X12 | Ethernet fieldbus, port 2 |
| [4] | X21 – X28 | Binary inputs/outputs |
| [5] | X14 | SBus (CAN) – external |
| [6] | X16 | RS485 interface – external |
| [7] | | PE connection |
| [8] | | Maintenance switch |



5.8.2 Plug connector positions

The following figure shows the cable glands and plug connectors of the hybrid ABOX:

PROFINET MTA11A-503-S643-...-00
EtherNet/IP MTA11A-503-S643-...-00
Modbus/TCP MTA11A-503-S643-...-00



27021600817498635

[1]	X1	AC 400 V input	(terminals underneath the M25 gland)
[2]	X1	Reserved	(M25 gland)
[3]	X8	Drive unit connection	(M23 H-Tec, SEW P insert 15-pole, female)
		• AC 400 V output (SNI cable)	
		• or AC 400 V output and CAN bus (hybrid cable)	
		• or AC 400 V output	
[4]	X11	Ethernet fieldbus, port 1	(Han [®] 3 A RJ45)
[5]	X12	Ethernet fieldbus, port 2	(Han [®] 3 A RJ45)
[6]	X21 – X28	Binary inputs/outputs	(M12, 5-pole, female, A-coded)
[7]	X14	SBus (CAN) – external	(M12, 5-pole, female, A-coded)
[8]	X16	RS485 interface – external	(M12, 5-pole, female, B-coded)
[9]	X20	Reserved	(M20 gland)
[10]	X20	DC 24 V input	(terminals underneath the M20 gland)

You find the pin assignment of the plug connectors in the the "Electrical Connections" chapter.



5.9 Electrical connections


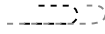
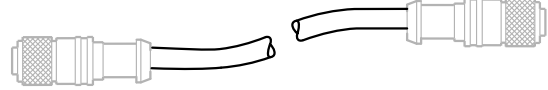

5.9.1 Connection cables

Connection cables are not included in the scope of delivery.

Prefabricated cables for connection between SEW components can be ordered from SEW-EURODRIVE at any time. They are described in the following sections. Specify the part number and length of the required cable in your order.

The number and design of the required connection cables depend on the design of the units and the components to be connected. This is why not all cables that are listed are actually required.

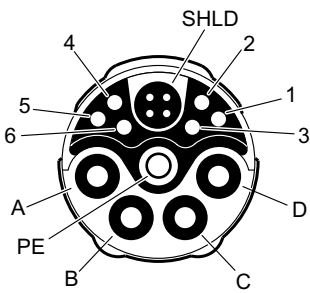
The following figures show the different cable designs:

Cable	Length	Installation type
	Fixed length	Suitable for cable carrier installation 
	Variable length	Not suitable for cable carrier installation 



5.9.2 X8: AC 400 V output (SNI)

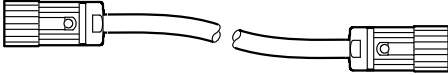

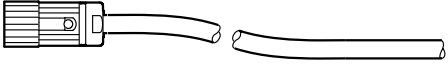

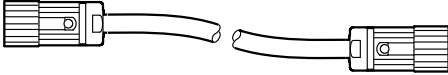

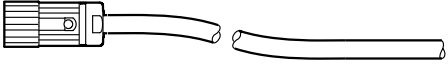

The following table shows information about this connection:

Function		
AC 400 V output for Single Line Network Installation (SNI) of the hybrid ABOX		
Connection type		
M23 H-Tec, SEW P insert 15-pole, female, coding ring red-violet		
Wiring diagram		
 <p style="text-align: right;">2497125387</p>		
Assignment		
No.	Name	Function
A	L1_SNI	Actuator supply phase L1 with SNI communication
B	L2_SNI	Actuator supply phase L2 with SNI communication
C	L3_SNI	Actuator supply phase L3 with SNI communication
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	res.	Reserved
8	res.	Reserved
9	res.	Reserved
10	res.	Reserved
SHLD	res.	Reserved



Connection cables

The following table provides an overview of the cables available for this connection:

Compliance 1)	Connection cable	Length/ Installation type	Cable cross section/cable type
CE	Part number 1 812 750 9  M23, coding ring: Red M23, coding ring: Red	Variable 	2.5 mm ² HELUKABEL TOPFLEX® – EMV- UV-2YSLCYK-J
	Part number 1 812 751 7  M23, coding ring: Red Open	Variable 	2.5 mm ² HELUKABEL TOPFLEX® – EMV- UV-2YSLCYK-J
	Part number 1 812 752 5  M23, coding ring: Red M23, coding ring: Red	Variable 	4 mm ² HELUKABEL TOPFLEX® – EMV- UV-2YSLCYK-J
	Part number 1 812 753 3  M23, coding ring: Red Open	Variable 	4 mm ² HELUKABEL TOPFLEX® – EMV- UV-2YSLCYK-J

1) See also technical data

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 812 751 7 and 1 812 753 3

Signal name	Color coding
L1_SNI	Brown
L2_SNI	Black
L3_SNI	Gray
PE	Green/yellow



5.9.3 X8: AC 400 V output and CAN bus (DSC hybrid)

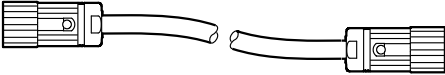

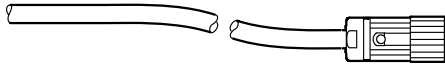

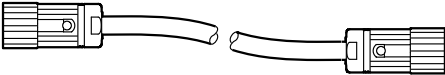

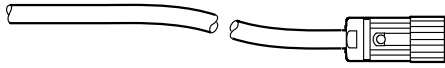

The following table shows information about this connection:

Function		
AC 400 V output, CAN bus (SBus)		
Connection type		
M23 H-Tec, SEW P insert 15-pole, female, coding ring red-violet		
Wiring diagram		
2749367179		
Assignment		
No.	Name	Function
A	L1	Actuator supply phase L1
B	L2	Actuator supply phase L2
C	L3	Actuator supply phase L3
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	CAN_L	CAN data line (low)
8	CAN_GND	Reference potential CAN bus
9	CAN_H	CAN data line (high)
10	n.c.	Not connected
SHLD	CAN_SHLD	Shield/equipotential bonding CAN bus



Connection cables

The following table provides an overview of the cables available for this connection:

Compliance 1)	Connection cable	Length/ Installation type	Cable cross section/ cable type	Operating voltage
CE / UL	Part number 1 812 742 8  M23, coding ring: violet M23, coding ring: violet	Variable 	2.5 mm ² LEONI Elocab Type: EHRK 016281	AC 500 V
	Part number 1 812 743 6  Open M23, coding ring: violet	Variable 	2.5 mm ² LEONI Elocab Type: EHRK 016281	AC 500 V
	Part number 1 812 744 4  M23, coding ring: violet M23, coding ring: violet	Variable 	4 mm ² LEONI Elocab Type: EHRK 018473	AC 500 V
	Part number 1 812 745 2  Open M23, coding ring: violet	Variable 	4 mm ² LEONI Elocab Type: EHRK 018473	AC 500 V

1) See also technical data

Connection of cables with open end

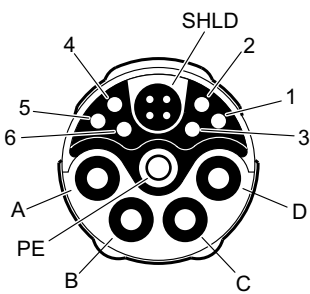
The following table shows the conductor assignment of the cable with part number: 1 812 743 6 and 1 812 745 2

Signal name	Core color/designation
L1	Black / 1
L2	Black / 2
L3	Black / 3
PE	Green/yellow
CAN_L	Blue
CAN_GND	Black
CAN_H	White



5.9.4 X8: AC 400 V output (DSC)

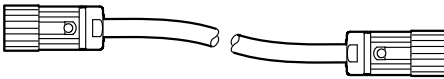

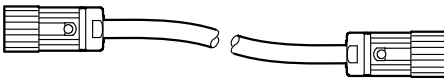
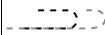
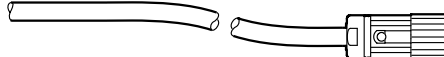
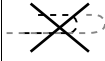

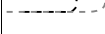
The following table shows information about this connection:

Function		
AC 400 V connection for supplying the unit/for looping through		
Connection type		
M23, SEW insert, SpeedTec-capable, company: Intercontec, female, coding ring: Black, protected against contact		
Wiring diagram		
		
2497125387		
Assignment		
No.	Name	Function
A	L1	Line connection phase L1
B	L2	Line connection phase L2
C	L3	Line connection phase L3
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	n.c.	Not connected
8	n.c.	Not connected
9	n.c.	Not connected
10	n.c.	Not connected
SHLD	n.c.	Not connected

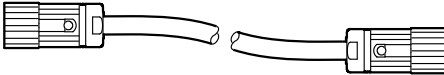
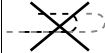
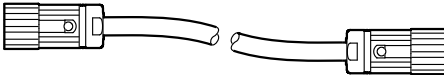
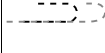
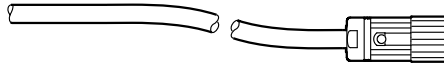

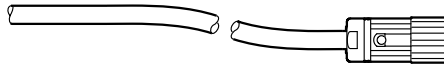
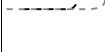


Connection cables

The following table provides an overview of the cables available for this connection:

Compliance 1)	Connection cable	Length/ Installation type	Cable cross section	Operating voltage
CE	Part number 1 812 746 0  M23, coding ring: Black M23, coding ring: Black	Variable 	2.5 mm ²	AC 500 V
	Part number 1 813 395 9 Halogen-free  M23, coding ring: Black M23, coding ring: Black	Variable 	2.5 mm ²	AC 500 V
	Part number 1 812 747 9  Open M23, coding ring: Black	Variable 	2.5 mm ²	AC 500 V
	Part number 1 813 396 7 Halogen-free  Open M23, coding ring: Black	Variable 	2.5 mm ²	AC 500 V



Compliance 1)	Connection cable	Length/ Installation type	Cable cross section	Operating voltage
CE	Part number 1 812 748 7  M23, coding ring: Black	Variable 	4 mm ²	AC 500 V
	Part number 1 813 397 5 Halogen-free  M23, coding ring: Black	Variable 	4 mm ²	AC 500 V
	Part number 1 812 749 5  Open	Variable 	4 mm ²	AC 500 V
	Part number 1 813 398 3 Halogen-free  Open	Variable 	4 mm ²	AC 500 V

1) See also technical data

Connection of
cables with open
end

The following table shows the conductor assignment of the cables with the following part

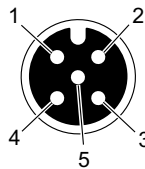
numbers: 1 812 747 9, 1 813 396 7, 1 812 749 5 and 1 813 398 3

Signal name	Core color/designation
L1	Black / 1
L2	Black / 2
L3	Black / 3
PE	Green/yellow




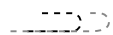


5.9.5 X14: CAN BUS / SBus interface

The following table shows information about this connection:

Function		
CAN bus of the hybrid ABOX for external components		
Connection type		
M12, 5-pole, female, A-coded, violet		
Wiring diagram		
		
2264816267		
Assignment		
No.	Name	Function
1	CAN_SHLD	Shield/equipotential bonding
2	+5V_CAN	DC 5 V output (supply of CAN interface)
3	CAN_GND	Reference potential for CAN data line
4	CAN_H	CAN data line (high)
5	CAN_L	CAN data line (low)

Connection cables

The following table provides an overview of the cables available for this connection:

Connection cable	Length/installation type
Length 5 m: Part no. 1 328 633 1 Length 10 m: Part no. 1 328 635 8 Length 15 m: Part no. 1 328 636 6 Cable design: ((1X2X0.2)+(1X2X0.32)+1X0.32) 	Fixed length 
Length 5 m: Part no. 1 328 140 2 Length 10 m: Part no. 1 328 141 0 Length 15 m: Part no. 1 328 142 9 Cable design: ((1X2X0.2)+(1X2X0.32)+1X0.32) 	Fixed length 
M12 M12, female	Open (Conductor end sleeves)



*Connection of
cables with open
ends*

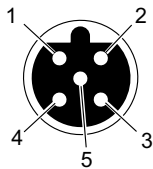
The following table shows the conductor assignment of the cables with the following part numbers:

- 1 328 140 2
- 1 328 141 0
- 1 328 142 9

Signal name	Color coding
CAN_SHLD	Gray
+5V_CAN	Red
GND	Black
CAN_H	White
CAN_L	Blue

5.9.6 X16: RS485 interface – external

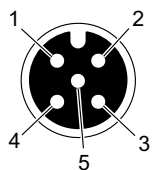
The following table shows information about this connection:

Function		
RS485 interface of the hybrid ABOX for external components		
Connection type		
M12, 5-pole, female, B-coded, black		
Wiring diagram		
		
2354431115		
Assignment		
No.	Name	Function
1	res.	Reserved
2	RS -	RS485 data line (-)
3	res.	Reserved
4	RS +	RS485 data line (+)
5	res.	Reserved



5.9.7 X21 – X28: Binary inputs/outputs

The following table shows information about this connection:

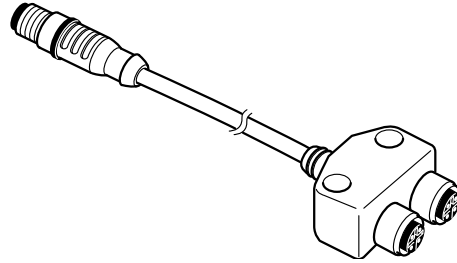
Function				
Binary inputs/outputs of the hybrid ABOX				
Connection type				
M12, 5-pole, female, A-coded				
Wiring diagram				
				
2264816267				
Assignment				
No.	X21	X22	X23	X24
1	+24V	+24V	+24V	+24V
2	DI01 / DO01	DI03 / DO03	DI05	DI07
3	GND	GND	GND	GND
4	DI00 / DO00	DI02 / DO02	DI04	DI06
5	n.c.	n.c.	n.c.	n.c.
No.	X25	X26	X27	X28
1	+24V	+24V	+24V	+24V
2	DI09	DI11	DI13	DI15
3	GND	GND	GND	GND
4	DI08	DI10	DI12	DI14
5	n.c.	n.c.	n.c.	n.c.



Y adapter

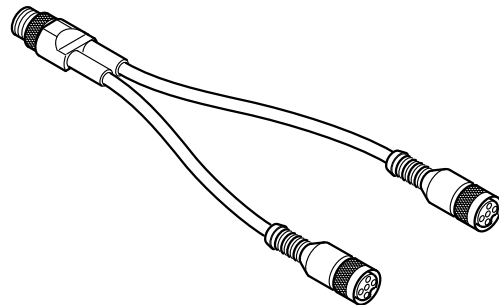
For connecting 2 sensors/actuators to an M12 plug connector, use a Y adapter with extension.

The Y adapter is available from different manufacturers:



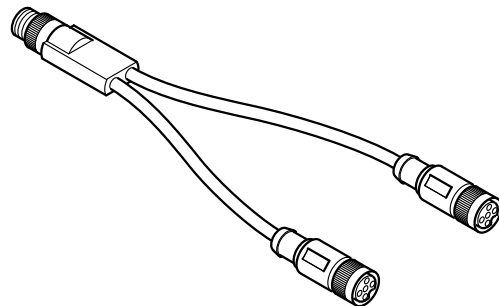
915294347

Manufacturer: Escha
Type: WAS4-0,3-2FKM3/..



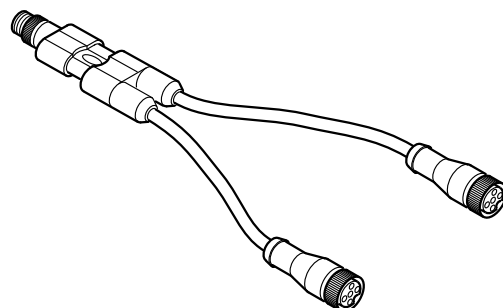
1180380683

Manufacturer: Binder
Type: 79 5200 ..



1180375179

Manufacturer: Phoenix Contact
Type: SAC-3P-Y-2XFS SCO/.../...



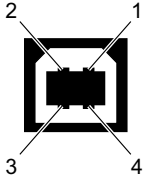
1180386571

Manufacturer: Murr
Type: 7000-40721-..



5.9.8 X51: USB interface

The following table informs about this connection:

Function		
USB interface of the EBOX		
Connection type		
USB type B, female		
Wiring diagram		
		
3053382411		
Assignment		
No.	Name	Function
1	+5V	+5 V output
2	USB–	USB data line (–)
3	USB+	USB data line (+)
4	GND	Reference potential

USB interface X51 comprises the following functions:

- MOVIFIT® engineering and diagnostics with MOVITOOLS® MotionStudio


Connection cable

- Use a commercially available USB cable with a type B USB plug.
- Maximum permitted length of the USB cable: 5 m.



5.9.9 X52: Ethernet service interface

The following table informs about this connection:

Function		
Ethernet service interface of the EBOX		
Connection type		
Ethernet-RJ45		
Wiring diagram		
 <p style="text-align: right;">2354433675</p>		
Assignment		
No.	Name	Function
1	TX+	Transmit line (+)
2	TX-	Transmit line (-)
3	RX+	Receive line (+)
4	Res.	Reserved
5	Res.	Reserved
6	RX-	Receive line (-)
7	Res.	Reserved
8	Res.	Reserved

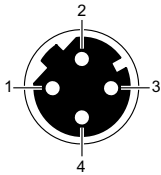
EtherNet service interface X52 comprises the following functions:

- MOVIFIT[®] engineering and diagnostics with MOVITOOLS[®] MotionStudio



5.9.10 X11 und X12: Ethernet fieldbus interface (ABOX "MTA...-S54.-...-00")


The following table informs about this connection:

Function		
Ethernet fieldbus interface of the hybrid ABOX "MTA...-S54.-...-00"		
<ul style="list-style-type: none"> • PROFINET IO • EtherNet/IP • Modbus/TCP 		
Connection type		
M12, 4-pole, female, D-coded		
Wiring diagram		
		
2464600971		
Assignment		
No.	Name	Function
1	TX+	Transmit line (+)
2	RX+	Receive line (+)
3	TX-	Transmit line (-)
4	RX-	Receive line (-)



5.9.11 X11 und X12: Ethernet fieldbus interface (ABOX "MTA...-S64.-...-00")

The following table informs about this connection:

Function		
Ethernet fieldbus interface of the hybrid ABOX "MTA...-S64.-...-00"		
<ul style="list-style-type: none"> • PROFINET IO • EtherNet/IP • Modbus/TCP 		
Connection type		
Ethernet-RJ45		
Wiring diagram		
		
2354433675		
Assignment		
No.	Name	Function
1	TX+	Transmit line (+)
2	TX-	Transmit line (-)
3	RX+	Receive line (+)
4	res.	Reserved
5	res.	Reserved
6	RX-	Receive line (-)
7	res.	Reserved
8	res.	Reserved

Connection cables

NOTICE

The RJ45 socket can be damaged by inserting commercially available RJ45 patch cables without push-pull connector housing.

Damage to the RJ45 socket.

- Only plug suitable push-pull RJ45 mating connectors according to IEC PAS 61076-3-117 into push-pull RJ45 sockets.
- Never use commercially available RJ45 patch cables without push-pull connector housing. These plug connectors do not snap in place when they are plugged. They may damage the socket and are therefore not suited.



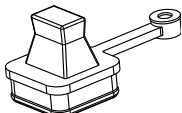
INFORMATION

Use only shielded cables for this connection.



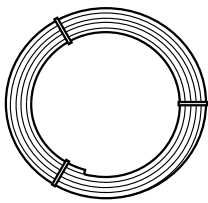
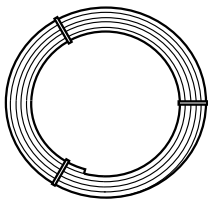


Closing plug, optional

Type	Figure	Content	Part number
Ethernet closing plug for push-pull RJ45 socket		10 pcs	1822 370 2
		30 pcs	1822 371 0

5.10 Required SNI cables

The following table gives an overview of available SNI cables:

Compliance 1)	SNI cable	Cable cross section cable type
CE	Part number 1 330 330 9 Cable reel 30 m Cable reel 100 m Cable reel 200 m  Open cable end (bulk cable)	2.5 mm ² HELUKABEL TOPFLEX® – EMV- UV-2YSLCYK-J
	Part number 1 330 550 6 Cable reel 30 m Cable reel 100 m Cable reel 200 m  Open cable end (bulk cable)	4 mm ² HELUKABEL TOPFLEX® – EMV- UV-2YSLCYK-J

1) See also technical data



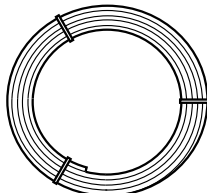
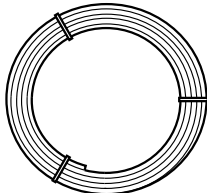
INFORMATION

You find more permitted SNI cables (e.g. for UL-compliant installation) in the technical data / chapter "Prescribed connection cables for single-line installation".



5.11 Recommended hybrid cables

The following table shows available hybrid cables:

Hybrid cable		Cable cross section/ manufacturer
Part no. 1 328 477 0 Cable reel 30 m Cable reel 100 m Cable reel 200 m  Open cable end (bulk cable)		2.5 mm ² LEONI Elocab Type: EHRK 016281
Part no. 1 331 363 0 Cable reel 30 m Cable reel 100 m Cable reel 200 m  Open cable end (bulk cable)		4 mm ² LEONI Elocab Type: EHRK 018473



5.12 Connection examples

5.12.1 Connecting external SBus

The following figures show the connection of SBus slave units to MOVIFIT® FDC:

- If the MOVIFIT® unit is located at the end of an SBus segment, it is only connected via the incoming SBus cable (CAN).
- To prevent malfunctions in the bus system due to reflections, etc., the SBus segment must be terminated using bus terminating resistors at the first and last physical stations.
- The bus terminating resistors are already installed in the MOVIFIT® ABOX and can be activated using switch S3.

Connection example 1:

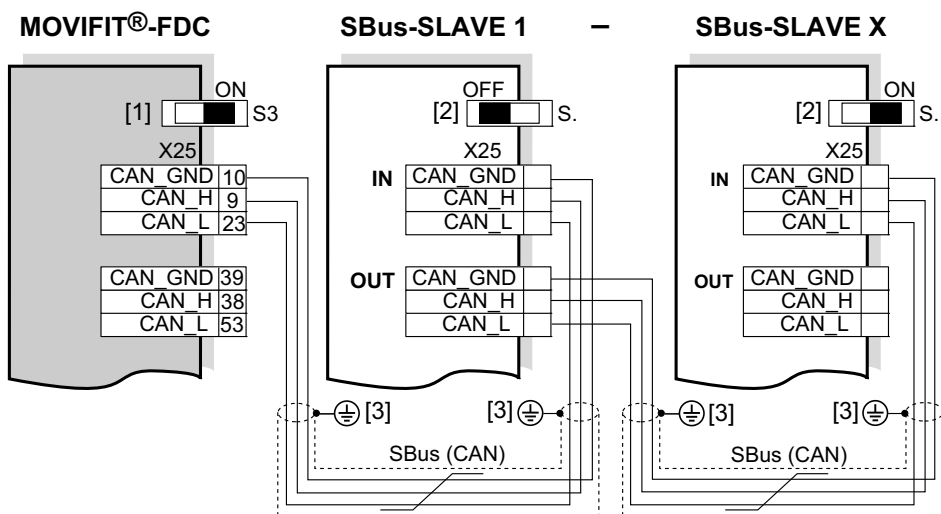


INFORMATION

Connection example 1 applies in combination with the following master ABOXes:

- Standard ABOX "MTA...-S04.-...-00"
- Hybrid ABOX "MTA...-S54.-...-00"
- Hybrid-ABOX "MTA...-S64.-...-00"

The SBus master MOVIFIT® FDC is located at the end of the SBus segment.
DIP switch S3 of the SBus master MOVIFIT® FDC = "ON".



4273650443

X = 16 – Number of connected SNI units

- [1] DIP switch S3 for bus termination
- [2] DIP switch for bus termination in the slave unit
- [3] EMC cable gland



INFORMATION

If the SBus is connected to the master using the external plug connector X14, then only connection example 1 is possible.



Connection example 2:



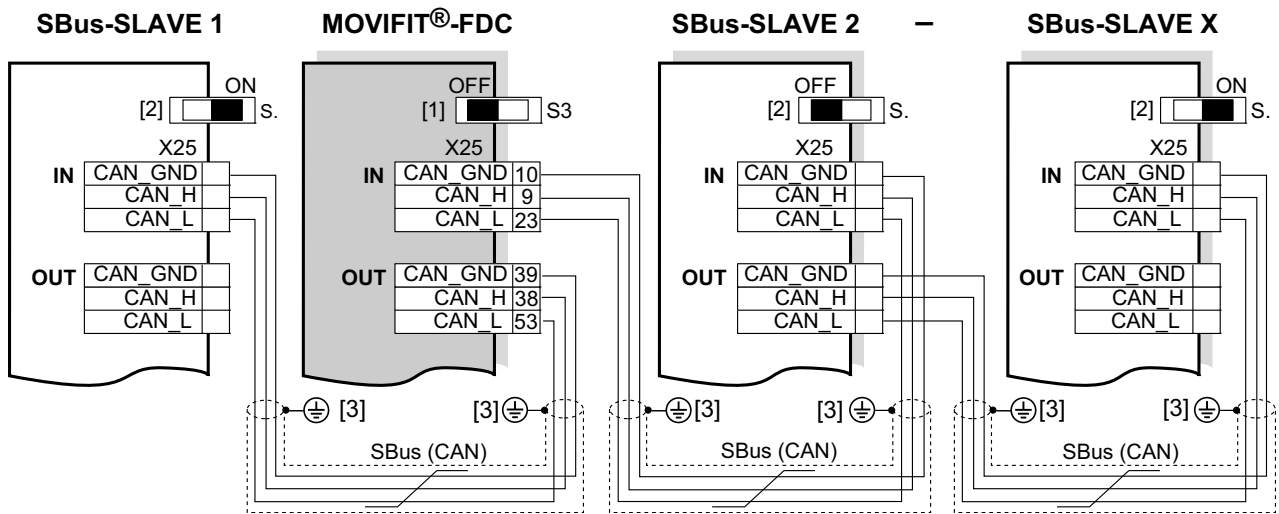
INFORMATION

The connection example below applies in combination with the following master ABOX:

- Standard ABOX "MTA...-S04.-...-00"

The SBus master MOVIFIT[®] FDC is located between the SBus slaves.

DIP switch S3 of the master MOVIFIT[®] FDC = "OFF".



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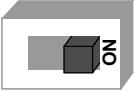
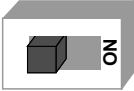
X = 16 – Number of connected SNI units

- [1] DIP switch S3 for bus termination
- [2] DIP switch for bus termination in the slave unit
- [3] EMC cable gland

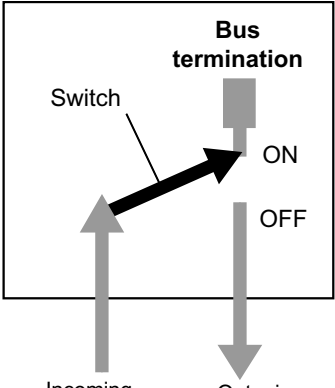
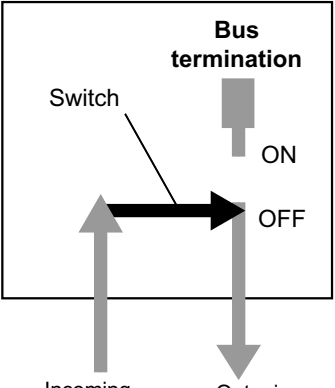


5.12.2 SBus termination

The bus terminating resistors are already installed in the MOVIFIT® ABOX and can be activated using switch S3.

Bus termination S3 = "ON"	Bus termination S3 = "OFF" (factory setting)
 <p>4275935371</p>	 <p>4275938571</p>

The following table shows the operating principle of the bus termination switch:

Bus termination switch S3	
Bus termination S3 = "ON"	Bus termination S3 = "OFF"
 <p>4276024203</p>	 <p>4276029067</p>



5.13 Wiring check

Before connecting power to the system for the first time, you must perform a wiring check to prevent damage to persons, systems and equipment caused by incorrect wiring:

- Remove all electronic units (EBOX) from the connection units (ABOX).
- Check the insulation of the wiring in accordance with applicable national standards.
- Check the grounding.
- Check the insulation between the supply system cable and the DC 24 V cable.
- Check the insulation between supply system cable and communication cables.
- Check the polarity of the DC 24 V cable.
- Check the polarity of the communication cables.
- Check the mains phase sequence.
- Ensure equipotential bonding between the MOVIFIT[®] units.

5.13.1 After the wiring check

- Install and fasten all electronics units (EBOX).
- Seal all cable openings and plug connections that are not in use.



6 Startup

6.1 General information



INFORMATION

You must comply with the general safety instructions in section "Safety Notes / General information" during startup.



⚠ WARNING

Electric shock due to dangerous voltages in the ABOX.

Severe or fatal injuries.

- Before removing or installing the EBOX, de-energize the MOVIFIT® unit using a suitable external cut-off device.
- Wait for at least 5 minutes before removing the EBOX.



⚠ WARNING

Danger of burns due to hot surfaces of the MOVIFIT® unit.

Severe injuries.

- Do not touch the MOVIFIT® until it has cooled down sufficiently.



⚠ WARNING

Uncontrolled unit behavior due to ineffective emergency stop circuit.

Severe or fatal injuries.

- Comply with the installation notes.
- The installation must only be carried out by qualified personnel.



⚠ WARNING

Unit malfunction due to incorrect unit setting.

Severe or fatal injuries.

- Observe the startup notes.
- The installation must only be carried out by qualified personnel.
- Check the parameters and data sets.
- Use only settings that are consistent with the function.



NOTICE

Danger due to arcing.

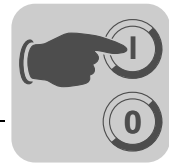
Damage to electrical components.

- Do not unplug the power connectors during operation. Do not plug in the power connectors during operation.



INFORMATION

To ensure fault-free operation, do not disconnect or connect the signal cables during operation.



6.2 Requirements

The following conditions apply to startup:

- MOVIFIT® and the MOVIGEAR® and DRC drive units must be installed correctly both mechanically and electrically.
- Appropriate safety measures prevent the MOVIGEAR® and DRC drives from starting up unintentionally.
- Appropriate safety measures must be taken to prevent risk of injury or damage to the machine.

The following hardware is required for startup:

- PC or laptop
- Commercially available USB cable, type B plug, or commercially available Ethernet cable

The following software is required on the PC or laptop:

- MOVITOOLS® MotionStudio version 5.8 or later

You find more information in the "Communication Controller DHR21B/41B and MOVIFIT® FDC with fieldbus Interface PROFINET IO" manual.

6.3 Description of the DIP switches



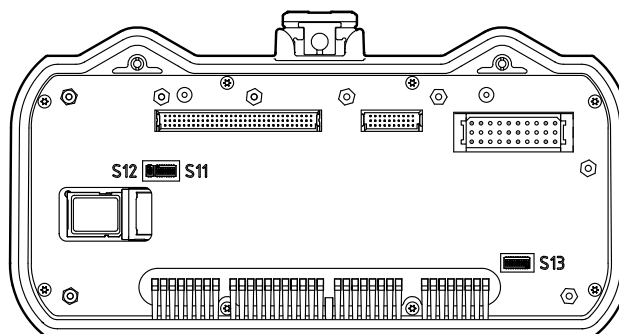
NOTICE

Hazard caused by unsuitable tools.

Damage to the DIP switches.

- To set the DIP switches use only suitable tools, such as a slotted screwdriver with a blade width smaller than 3 mm.
- The force used for setting the DIP switches must not exceed 5 N.

The following figure shows the position of DIP switches S11 – S13 in the EBOX:



5595786635



6.3.1 DIP switch S11

DIP switches S11/1 through S11/8 of the EBOX are set at the factory.

You are **not allowed** to change the setting of DIP switches S11/1 through S11/8.

6.3.2 DIP switch S12

The following table shows the functions of DIP switch S12:

DIP switch	S12	
	1 IP address allocation	2 Ethernet protocol
ON	DHCP / Saved IP parameters	PROFINET IO
OFF	Default values	EtherNet/IP or Modbus/TCP

DIP switch S12/1

Default IP

DIP switch S12/1 of the EBOX is used to set the type of IP address allocation.

- DIP switch S12/1 = ON: The saved IP parameters are used in PROFINET IO operation.
In Modbus/TCP and EtherNet/IP operation, the IP parameters are taken from a DHCP server (default) or from the address parameter of MOVIFIT® FDC (see "DHCP Start from configuration" parameter).
- DIP switch S12/1 = OFF: The IP parameters are set to the following default values:

IP address:	192.168.10.4
Subnet mask:	255.255.255.0
Gateway:	192.168.10.4

DIP switch S12/2

Ethernet protocol

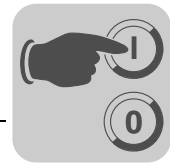
DIP switch S12/2 is used to select the Ethernet protocol of the connection between higher-level controller and MOVIFIT® FDC.

- DIP switch S12/2 = ON: PROFINET IO
- DIP switch S12/2 = OFF: EtherNet/IP or Modbus/TCP

6.3.3 DIP switch S13

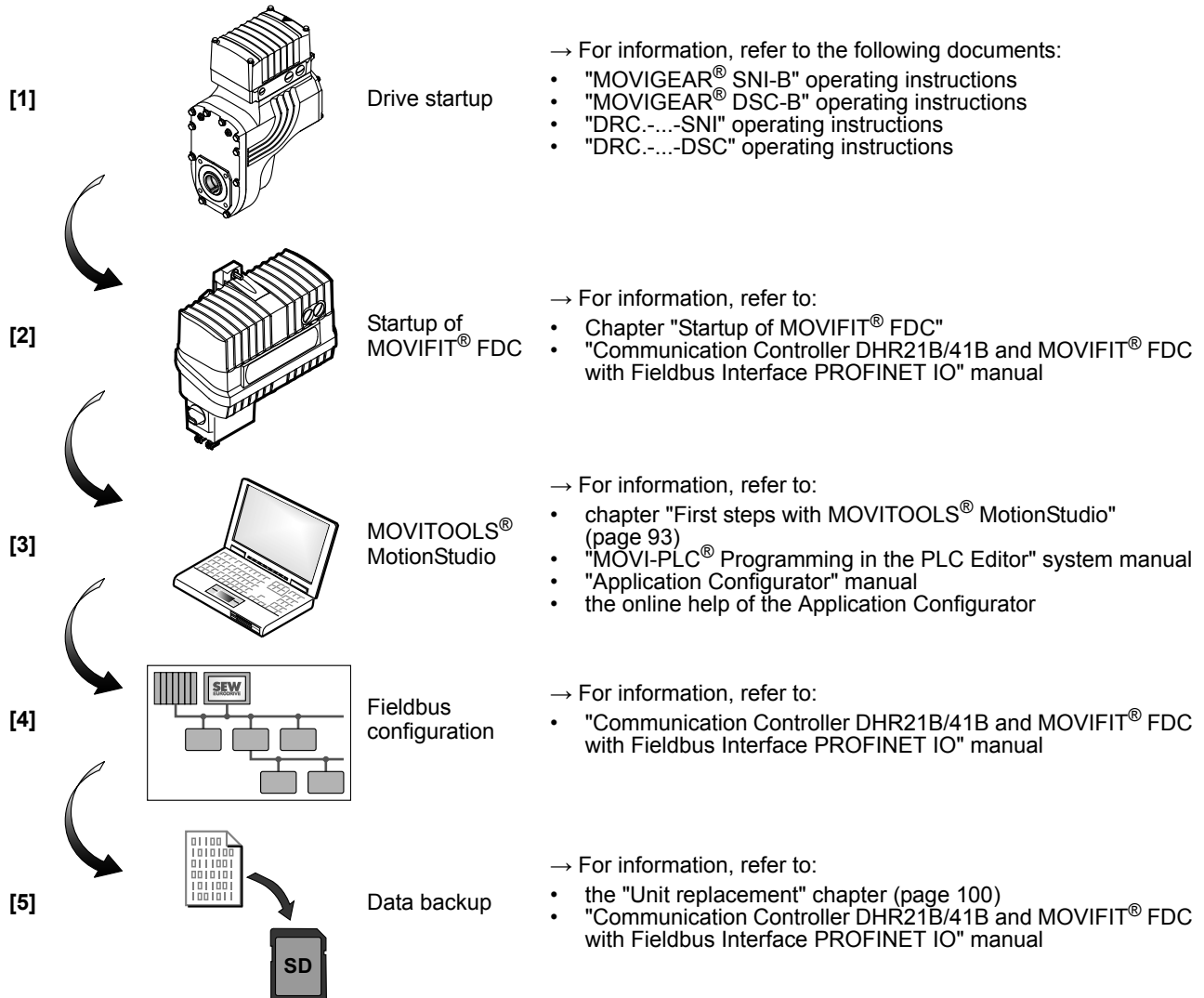
DIP switches S13/1 through S13/8 of the EBOX are set at the factory.

You are **not allowed** to change the setting of DIP switches S13/1 through S13/8.



6.4 Startup procedure

The following illustration gives an overview of the MOVIFIT® FDC startup procedure and lists other applicable documentation:



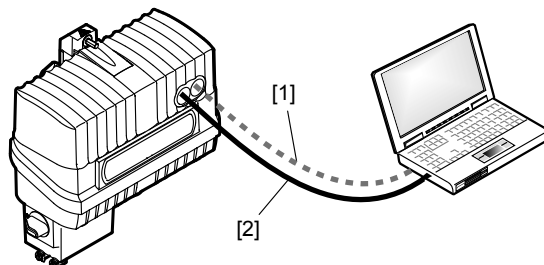
INFORMATION

You find more information on startup in the "MOVIGEAR® DSC-B / SNI-B and DRC-DSC / SNI Electronic Controller on the SEW Controller" manual.



6.5 PC/laptop connection

The following figure shows the connection between a PC/laptop and the engineering interface of MOVIFIT[®] FDC:



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- [1] Commercially available Ethernet cable You have to configure the Ethernet interface to a fixed IP address.
- [2] Commercially available USB cable, type B The USB interface configures itself automatically.

The following table shows the IP address, the subnet mask, and the standard gateway of the engineering interface of MOVIFIT[®] FDC:

Ethernet service interface		
Standard IP address	Subnet mask	Standard gateway
192.168.10.4	255.255.255.0	192.168.10.1

6.6 Startup of MOVIFIT[®] FDC



1. Check the connection of MOVIFIT[®] FDC.



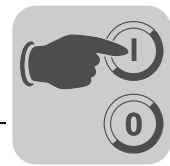
INFORMATION

With PROFINET IO, EtherNet/IP or Modbus/TCP, you do not have to make any settings on MOVIFIT[®] FDC. The entire startup is carried out using software tools. For a description, refer to the "Communication Controller DHR21B/41B and MOVIFIT[®] FDC with PROFINET IO Fieldbus Interface" manual:

2. Select the communication protocol using DIP switch S12/2.

PROFINET IO DIP switch S12/2 = ON	EtherNet/IP or Modbus/TCP DIP switch S12/2 = OFF
 <p>S12</p> <p>9007202400256779</p>	 <p>S12</p> <p>9007202400668171</p>

3. Place the MOVIFIT[®] EBOX onto the ABOX and close it.
4. Switch on the 24 V supply voltage. The "24V_C" LED should now light up green.



6.7 First steps with MOVITOOLS® MotionStudio

6.7.1 Starting the software and creating a project

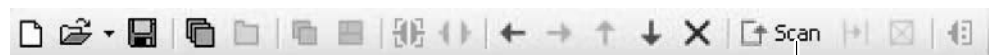
Proceed as follows to start MOVITOOLS® MotionStudio and create a project:

1. Start the MOVITOOLS® MotionStudio from the Windows start menu via:
[Start]/[Programs]/[SEW]/[MOVITOOLS MotionStudio]/[MOVITOOLS MotionStudio]
2. Create a project with name and storage location.

6.7.2 Establishing communication and scanning the network

Proceed as follows to establish a communication with MOVITOOLS® MotionStudio and to scan your network:

1. Set up a communication channel to communicate with your units.
You find more detailed information in the "Communication Controller DHR21B/41B and MOVIFIT® FDC with PROFINET IO Fieldbus Interface" manual.
2. Scan your network (unit scan). To do so, click the [Start network scan] button [1] in the toolbar.



[1]

9007200387461515

6.7.3 Programming MOVIFIT® FDC with the PLC-Editor



INFORMATION

You can program the MOVIFIT® FDC unit only when the SD memory card installed in the EBOX is a type OMH41B-T0 card.

You find more detailed information on how to program MOVIFIT® FDC in the "MOVI-PLC® programming in the PLC-Editor" system manual.

6.7.4 Configuring MOVIFIT® FDC with the Application Configurator



INFORMATION

You can configure the MOVIFIT® FDC unit only when the SD memory card installed in the EBOX is a type OMC41B-T0 card.

Proceed as follows to configure a unit:

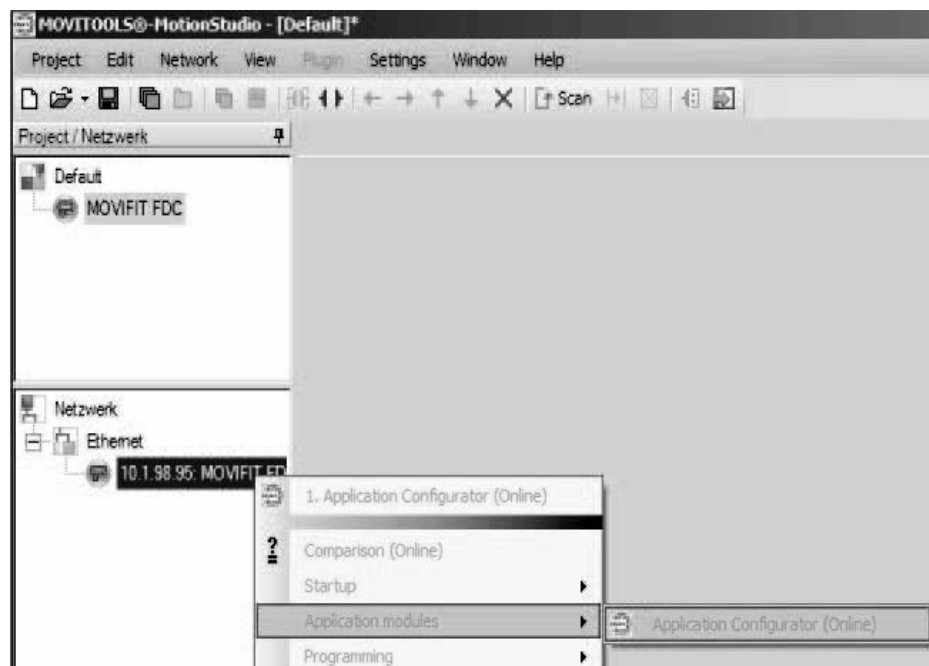
1. Select the unit in the network view.



Startup

First steps with MOVITOOLS® MotionStudio

2. Right-click to open the context menu and display the tools for configuring the unit.



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3. To open the Application Configurator, choose "Application Configurator" from the menu.



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4. Configure the unit in the Application Configurator.
You find detailed information in the "Application Configurator" manual.

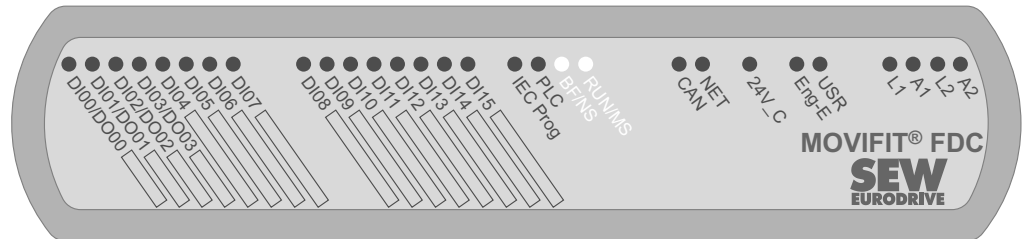


7 Operation

7.1 Status LEDs of MOVIFIT® FDC

7.1.1 General LEDs

This chapter describes the LEDs that are independent of the fieldbus. In the following figure, the LEDs are shown as dark:



2991635851

"DI.." LEDs

The "DI.." LED indicates the status of binary inputs DI..

LED status	Meaning
Yellow	Input signal present at binary input DI..
Off	Input signal at binary input DI.. open or "0".

"DO.." LEDs

The "DO.." LED indicates the status of binary outputs DO..

LED status	Meaning
Yellow	DO.. output switched.
Off	DO.. output logical "0"

LEDs "IEC Prog" and "PLC"

The "PLC" LED indicates the status of the **firmware of the control card**.

The "IEC Prog" LED indicates the **status of the control program**.

LED "PLC"	LED "IEC Prog"	Meaning	Troubleshooting
Red	Off	Unable to read SD card.	Insert a new SD card.
Flashing orange	Flashing orange	Bootloader update required.	Contact SEW Service.
Flashing green	Off	No application program loaded.	Make a configuration using the Application Configurator. (See "Application Configurator" manual) Load an IEC control program into the control card. (See MOVI-PLC® Programming system manual)
Flashing green	Green	Application program is running.	–
Flashing green	Flashing orange	Application program was stopped.	Start the application program if required.
Flashing green/orange	Irrelevant	Data backup is active.	–



Operation

Status LEDs of MOVIFIT® FDC

"CAN" LED

The **"CAN" LED** indicates the status of the **CAN 2** system bus.

LED status	Meaning	Troubleshooting
Orange	The CAN 2 system bus is being initialized.	-
Green	The CAN 2 system bus is initialized.	-
Flashing green (0.5 Hz)	The CAN 2 system bus is currently in SCOM suspend mode.	-
Flashing green (1 Hz)	The CAN 2 system bus is currently in SCOM On mode.	-
Red	The CAN 2 system bus is off (BUS-OFF).	<ol style="list-style-type: none"> 1. Check and correct the cabling of the CAN 2 system bus. 2. Check and correct the baud rate set for CAN 2. 3. Check and correct the terminating resistors of the CAN 2 system bus.
Flashing red (1 Hz)	Warning on the CAN 2 system bus.	<ol style="list-style-type: none"> 1. Check and correct the cabling of the CAN 2 system bus. 2. Check and correct the baud rate set for CAN 2.

"NET" LED

The **"NET" LED** indicates the status of the **SNI connection** between MOVIFIT® FDC and the drive unit (MOVIGEAR® / DRC).

LED status	Description
Flashing green	Communication active; data packages are being sent and received.
Flashing green/red	Communication is active; data packages are being sent and received, Ethernet collision.

"24V_C" LEDs

The **"24_C" LED** indicates the status of the 24V-C continuous voltage.

LED status	Meaning	Remedy
Green	24V_C continuous voltage is present	-
Off	24V_C continuous voltage is not present	Check 24V_C voltage supply.

"Eng-E" LED

The **"Eng-E" LED** indicates the status of the X52 service interface.

LED status	Meaning
Off	<u>No</u> Ethernet connection is established via the X52 service interface.
Green	An Ethernet connection has been established via the X52 service interface.
Flashing green	The X52 service interface transmits data.

"USR" LED

The **"USR" LED** is reserved.



LEDs "L1" and "L2" The **"L1" LED** indicates the **status of Ethernet fieldbus interface X11/X30**.
The **"L2" LED** indicates the **status of Ethernet fieldbus interface X12/X31**.

LED status	Meaning
Off	There is <u>no</u> Ethernet connection.
Green	There is an Ethernet connection.
Flashing green	Function for locating MOVIFIT® FDC with the Address Editor, see "Communication Controller DHR21B/41B and MOVIFIT® FDC with PROFINET IO Fieldbus Interface" manual

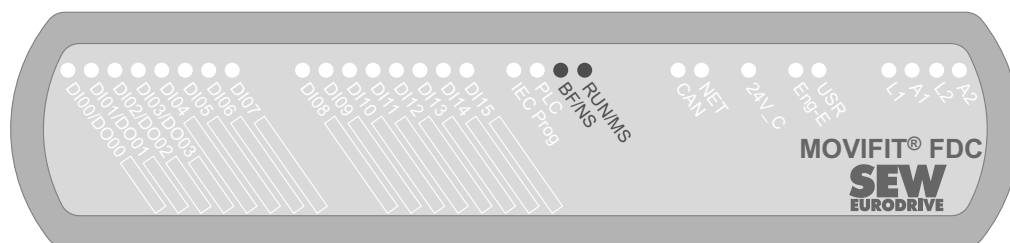
LEDs "A1" and "A2" The **"A1" LED** indicates the **activity of Ethernet fieldbus interface X11/X30**.
The **"A2" LED** indicates the **activity of Ethernet fieldbus interface X12/X31**.

LED status	Meaning
Off	No data is transmitted
Yellow	The Ethernet interface transmits data.



7.1.2 Bus-specific LEDs for PROFINET

This chapter describes the bus-specific LEDs for PROFINET. In the following figure, the LEDs are shown as dark:



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"BF/NS" LED

The "BF/NS" LED indicates the status of PROFINET.

LED status	Cause of error	Remedy
Off	<ul style="list-style-type: none"> PROFINET IO device is currently exchanging data with the PROFINET IO controller (Data Exchange). 	-
Flashing green Flashing green/red	<ul style="list-style-type: none"> The flashing function in the PROFINET IO controller configuration is activated to visually localize the stations. 	-
Red	<ul style="list-style-type: none"> Connection to the PROFINET IO controller has failed. PROFINET IO device does not detect a link. Bus interruption PROFINET IO controller is not in operation. 	<ul style="list-style-type: none"> Check the PROFINET connection. Check the PROFINET IO controller. Check the cabling of your PROFINET network.
Yellow Flashing yellow	<ul style="list-style-type: none"> The STEP 7 hardware configuration contains a module that is not permitted. 	<ul style="list-style-type: none"> Switch the STEP 7 hardware configuration to ONLINE and analyze the component status of the slots in the PROFINET IO device.

"RUN/MS" LED

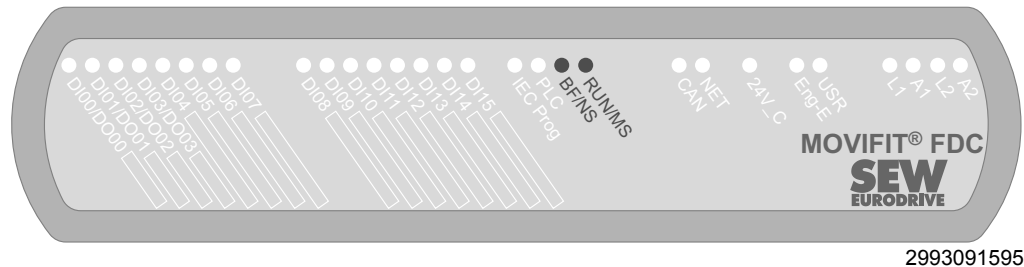
The "RUN/MS" LED indicates whether the bus electronics is functioning properly.

LED status	Cause of error	Remedy
Green	<ul style="list-style-type: none"> Control card ok. Proper operation. 	-
Off	<ul style="list-style-type: none"> Control card not ready. 	<ul style="list-style-type: none"> Switch the unit on again. Consult SEW Service if the error reoccurs.
Red	<ul style="list-style-type: none"> Control card error. 	
Flashing green	<ul style="list-style-type: none"> Control card does not start up. 	<ul style="list-style-type: none"> Switch the unit on again. Set the default IP address parameter with DIP switch S12/1 = OFF. Consult SEW service if the error occurs again.
Flashing yellow		
Yellow		<ul style="list-style-type: none"> Switch the unit on again. Consult SEW Service if the error occurs again.



7.1.3 Bus-specific LEDs for EtherNet/IP and Modbus/TCP

This chapter describes the bus-specific LEDs for Ethernet/IP and Modbus/TCP. In the following figure, the LEDs are shown as dark:



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"BF/NS" LED

The "BF/NS" LED signals the network status of EtherNet/IP and Modbus/TCP.

LED status	Meaning
Off	The control card does not yet have any IP parameters.
Flashing green/red	The control card performs an LED test.
Flashing green	There is no controlling IO connection.
Green	There is a controlling EtherNet/IP or Modbus/TCP connection.
Red	Conflict detected in the assigned IP addresses. Another station in the network uses the same IP address.
Flashing red	The previously established controlling IO connection is in timeout state. The state is reset by restarting communication.

"RUN/MS" LED

The "RUN/MS" indicates the module status of EtherNet/IP and Modbus/TCP.

LED status	Meaning
Off	The control card is either not supplied with voltage or it is faulty.
Flashing green	<ul style="list-style-type: none"> When the "BF/NS" LED is off at the same time, the TCP/IP stack of the control card is started. If this state continues and DHCP is activated, the control card waits for data from the DHCP server. When the "BF/NS" LED flashes green at the same time, the application of the control card is started.
Flashing green/red	The control card performs an LED test.
Green	Indicates the standard operating state of the control card.
Red	Control card error.
Flashing red	Conflict detected in the assigned IP addresses. Another station in the network uses the same IP address.



8 Service

8.1 Unit diagnostics



INFORMATION

The error diagnostics of the MOVIFIT® FDC unit is mainly available on the PC/laptop. You find more detailed information in the "Communication Controller DHR21B/41B and MOVIFIT® FDC with PROFINET IO Fieldbus Interface" manual.

8.2 Unit replacement

8.2.1 Notes on replacing units

The MOVIFIT® FDC unit allows for a quick unit replacement. The EBOX is equipped with a replaceable memory card on which all unit data can be stored.

If the EBOX has to be replaced, the plant can be started up again quickly by simply re-plugging the memory card.

After startup, you have to download the unit data to the memory card.



INFORMATION

Observe the following notes when replacing a unit:

- **Before replacing the unit**, make a data backup:
 - In MOVITOOLS® MotionStudio, right-click the MOVIFIT® FDC symbol.
 - Choose [Startup] / [Data Management].
 - Choose "Upload".
 - Next, click the [Start upload] button.

You find more information in the "Communication Controller DHR21B/41B and MOVIFIT® FDC with fieldbus Interface PROFINET IO" manual.
- The MOVIFIT® FDC unit must be switched off when you insert the memory card.
- After the replacement, the parameters last saved on the SD card are used.



8.2.2 Replacing the unit

Proceed as follows to replace the MOVIFIT® EBOX:

1. Perform a data backup now if you are not certain whether the current unit parameterization is stored on the SD card.
2. De-energize the MOVIFIT® FDC unit and wait at least 5 minutes.
3. Loosen the retaining screw and remove the EBOX from the ABOX.
4. Remove the memory card from the previous EBOX.
5. Insert the memory card into the new EBOX.
6. Position the EBOX on the ABOX.

Tighten the retaining screw.

7. Switch on the MOVIFIT® FDC unit with the new EBOX.

"PLC" LED:	Flashing green/orange
The data backup of the communication and control unit is restored. This process can take several minutes. Do not switch off the MOVIFIT® FDC unit during this time!	



"PLC" LED:	Flashing green
"IEC Prog" LED:	Lit green
The data of the communication and control unit has been restored. Boot process is active. Data backup of the MOVIGEAR® and DRC drive units is restored.	

8. The parameters saved on the card are now available again.
If required, you can change the parameter set or save the changed unit data on the memory card after startup.
9. For applications with motor encoder or distance encoder, you have to perform a reference travel.

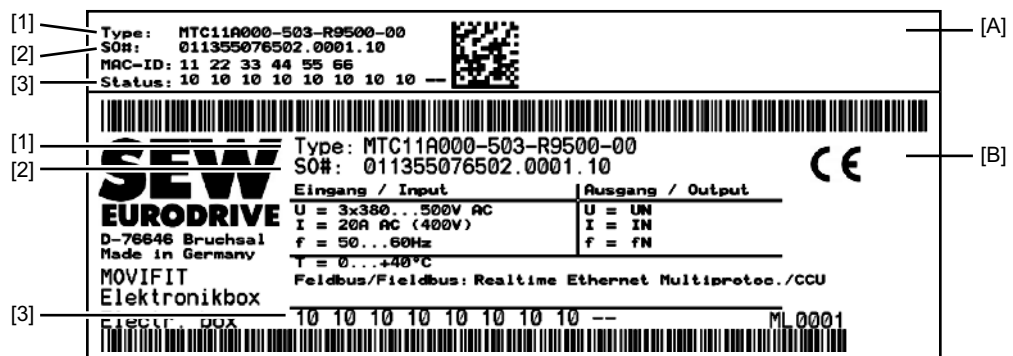


8.3 SEW Electronics Service

If a fault cannot be solved, please contact the SEW-EURODRIVE Service (see chapter "Address List").

Please have the following information at hand when you consult the SEW Service:

- Type designation [1]
- Serial number [2]
- Digits in the status field [3]
- Brief description of the application
- Nature of the fault
- Accompanying circumstances (e.g. initial startup)
- Your own assumptions
- Any unusual events preceding the problem, etc.



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- [A] External nameplate
- [B] Internal nameplate
- [1] Type designation
- [2] Serial number
- [3] Status field



8.4 Storage

Observe the following instructions when shutting down or storing MOVIFIT® units:

- If you shut down and store the unit for a longer period, you must cover the connections with the protective caps supplied.
- Make sure that the unit is not subject to mechanical impact during storage.
- Connect the unit to the power supply for at least 5 minutes every 2 years.

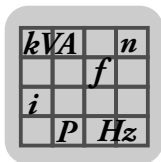
Observe the notes on storage temperature in section "Technical Data".

8.5 Disposal

This product consists of:

- Iron
- Aluminum
- Copper
- Plastics
- Electronic components

Dispose of all components in accordance with applicable regulations!



9 Technical Data

9.1 CE marking and UL approval

9.1.1 CE marking

- Low voltage directive:
MOVIFIT® FDC meets the requirements stipulated in the Low Voltage Directive 2006/95/EC.
- Electromagnetic compatibility (EMC):
MOVIFIT® FDC units are designed for use as components for installation in machinery and systems. They comply with the EMC product standard EN 61800-3 "Variable-speed electrical drives". Provided that you comply with the installation instructions, the CE marking requirements for the entire machine/system in which they are installed are satisfied on the basis of the EMC directive 2004/108/EC. For detailed information on EMC compliant installation, refer to the publication "Electromagnetic Compatibility in Drive Engineering" from SEW-EURODRIVE.

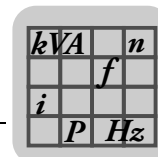


The CE mark on the nameplate indicates conformity with the Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC.

9.1.2 UL approval

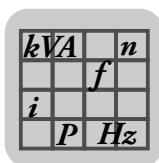


UL and cUL approval for the MOVIFIT® FDC series is available.



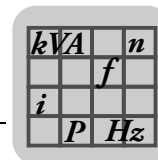
9.2 Basic unit

Input		
Supply voltage	V_{line}	AC 3 x 380 V - 5% to AC 3 x 500 V + 10%
Line frequency	f_{line}	50 – 60 Hz \pm 5%
Line input current 100% (at V_{line} = AC 3 x 380 V)	I_{line}	AC 20 A
Output		
Nominal output power	P_N	8 kW
Nominal output current	I_N	AC 15 A for the M16 motor circuit breaker variant AC 20 A for the M20 motor circuit breaker variant
Line protection to MOVIGEAR® / DRC drive unit		Motor protection switch; ABB MS325, Factory setting depends on cable cross section of SNI cable/hybrid cable <ul style="list-style-type: none"> • 3 x 2.5 mm² => type M16 (15 A) • 3 x 4.0 mm² => type M20 (20 A)
Cable length between MOVIFIT® and the MOVIGEAR® DRC drive unit		SNI cable, for example HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J max. 100 m
		Hybrid cable, for example LEONI Elocab EHRK 016281 at 1 MBaud: max. 25 m at 500 kBaud: max. 50 m
General information		
Interference immunity		Meets EN 61800-3
Interference emission with EMC compliant installation		According to limit value class C3 to EN 61800-3
Ambient temperature	ϑ_A	0 – +40 °C, non-condensing, no moisture condensation
Climate class		EN 60721-3-3, class 3K3
Storage temperature	ϑ_F	-25 – +75 °C (EN 60721-3-3, class 3K3)
Permissible oscillation and impact load		According to EN 61800-5-1
Degree of protection		IP65 according to EN 60529 (MOVIFIT® housing closed and all cable glands and plug connections sealed)
Cooling type (DIN 41751)		Self-cooling
Overvoltage category		III according to IEC 60664-1 (VDE 0110-1)
Pollution class		2 according to IEC 60664-1 (VDE 0110-1) within the housing
Installation altitude	h	Up to 2000 m without restrictions (installation altitudes higher than 2000: see operating instructions, chapter "Electrical Installation" / "Installation instructions" / "Installation heights above 1000 asl")
Mass	m	about 9 kg
Dimensions	$W \times H \times D$	334 x 190 x 333 mm



9.3 Electronics data

Electronics data	
DC 24 V supply 24V_C (continuous)	$V_{IN} = \text{DC } 24 \text{ V } -15\% / +20\%$ according to EN 61131-2 Current consumption: $I_E \leq 500 \text{ mA}$, typically 200 mA (for MOVIFIT® electronics) <ul style="list-style-type: none"> plus up to 2000 mA (4 outputs with 500 mA each) plus up to 1400 mA (for sensor supply depending on the number and type of connected sensors)
Sensor supply X25	2 circuits <ul style="list-style-type: none"> Total current terminals 30 – 33: 700 mA Total current terminals 34 – 37: 700 mA
Electrical isolation	Separate potentials for: <ul style="list-style-type: none"> Fieldbus connection (X30, X31 internal or X11, X12 external) 24V_C for: <ul style="list-style-type: none"> MOVIFIT® electronics including USB interface DI00 – DI15 SBus interface RS485 interface 24 V outputs for sensors
Shielding of bus cables	using EMC metal cable glands and fittings, and with EMC shield clamp (see operating instructions, chapter "Installation instructions")



9.4 Communication and control unit

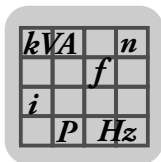
Control card				
Performance class	CCU standard	MOVI-PLC® standard	CCU advanced	MOVI-PLC® advanced
SD memory card	OMC41B-T0 (parameterizable)	OMH41B-T0 (programmable)	OMC41B-T0 to OMC41B-T25 (parameterizable)	OMH41B-T0 to OMH41B-T25 (programmable)
Task system	1 x free-running, minimum 10 ms 1 x cyclical 10 – 10000 ms		1 x free-running 8 x cyclical 1 – 10000 ms	
Memory	<ul style="list-style-type: none">• Program memory: 2 MB (for user program, incl. IEC libraries)• Data memory: 4 MB (for IEC application)• Retain data: 32 kB• System variables (retain): 8 kB		<ul style="list-style-type: none">• Program memory: 4 MB (for user program, incl. IEC libraries)• Data memory: 12 MB (for IEC application)• Retain data: 32 kB• System variables (retain): 8 kB	
Engineering	Engineering for all SEW components connected to MOVIFIT® FDC is carried out via <ul style="list-style-type: none">• USB service interface (X51)• Ethernet service interface (X52)• Ethernet fieldbus interface (X30 / X31 internal) or (X11 / X12 external) using the MOVITOOLS® MotionStudio software with PLC Editor.			
Ethernet fieldbus interface	Connection options: <ul style="list-style-type: none">• Engineering PC• Intranet• Higher-level controller (see following sections)			

9.4.1 Binary inputs

Binary inputs	
Number of inputs	16
Input type	PLC-compatible according to EN 61131-2 (digital inputs type 1) R_i about 3 k Ω , sampling cycle \leq 10 ms Signal level: DC +13 V – +30 V "1" = contact closed DC -3 V – +5 V "0" = contact open
Sensor supply	DC 24 V to EN 61131-2, interference-voltage proof and short-circuit proof
Rated current	500 mA
Internal voltage drop	max. 2 V

9.4.2 Binary outputs

Binary outputs	
Number of outputs	4
Output type	PLC-compatible to EN 61131-2, interference-voltage proof and short-circuit-proof
Rated current	500 mA
Leakage current	max. 0.2 mA
Internal voltage drop	max. 2 V



9.5 Interfaces

9.5.1 SBus interface

SBus	
SBus interface	Interface to other SBUS-capable SEW units CAN bus to CAN specification 2.0, parts A and B
Connection technology	M12, terminals
Transmission technology	ISO 11898 compliant
Bus termination	120 Ω terminating resistor can be activated using DIP switch S3 (ABOX).
CAN interface sensor supply	DC 5 V
Rated current	max. 100 mA

9.5.2 RS485 interface

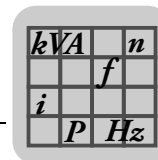
RS485 interface	
RS485 interface	Electrically isolated from MOVIFIT [®] electronics
Connection technology	M12, terminals
Standard	RS485 to EIA standard (with integrated dynamic terminating resistor)

9.5.3 USB service interface

USB	
USB service interface	Service interface, not electrically isolated from MOVIFIT [®] electronics according to USB-2.0 specification
Connection technology	USB socket, type B (on the EBOX)

9.5.4 Ethernet service interface

EtherNet/IP	
Automatic baud rate detection	10 MBd / 100 MBd
Connection technology	RJ45 (on the EBOX)
Maximum line length	100 m according to IEEE 802.3
Addressing	4 byte IP address or MAC ID (00-0F-69-xx-xx-xx) IP address: 192.168.10.4 Subnet mask: 255.255.255.0 Standard gateway: 192.168.10.1



9.5.5 Ethernet fieldbus interface

One of the following protocols can be used for communication via the Ethernet fieldbus interface (depending on DIP switch S12/2):

PROFINET interface

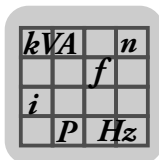
PROFINET	
PROFINET protocol option	PROFINET IO RT
Supported baud rates	100 Mbit/s (full duplex)
SEW ID number	010A _{hex}
Device ID number	2
Connection technology	2 x M12, 2 x RJ45 (push-pull) or 2 x RJ45 plug connector (in the ABOX)
Integrated switch	Supports auto-crossing, auto-negotiation
Permitted cable types	Category 5 and higher, class D according to IEC 11801
Maximum line length (from switch to switch)	100 m according to IEEE 802.3
GSD file name	GSDML-V2.1-SEW-MOVIFIT_FDC-20100401.xml
Bitmap file name	SEW-MOVIFIT-FDC.bmp

EtherNet/IP fieldbus interface

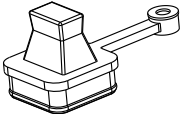
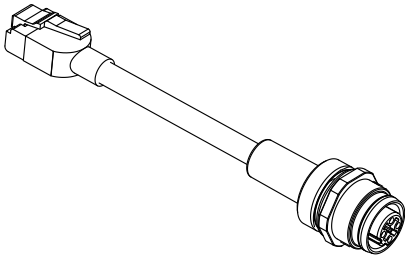

EtherNet/IP	
Automatic baud rate detection	10 MBd / 100 MBd
Connection technology	2 x M12, 2 x RJ45 (push-pull) or 2 x RJ45 plug connector (in the ABOX)
Integrated switch	Supports auto-crossing, auto-negotiation
Maximum line length	100 m according to IEEE 802.3
Addressing	4 byte IP address or MAC ID (00-0F-69-xx-xx-xx) configurable via DHCP server or MOVITOOLS® MotionStudio version 5.5 and higher, default address 192.168.10.4 (depending on the setting of DIP switch S12/1)
Manufacturer ID (vendor ID)	013B _{hex}
Name of EDS files	SEW_MOVIFIT_FDC.eds
Name of icon files	SEW_MOVIFIT_FDC.ico

Modbus/TCP interface

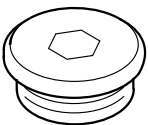

Modbus/TCP	
Automatic baud rate detection	10 MBd / 100 MBd
Connection technology	2 x M12, 2 x RJ45 (push-pull) or 2 x RJ45 plug connector (in the ABOX)
Integrated switch	Supports auto-crossing, auto-negotiation
Maximum line length	100 m according to IEEE 802.3
Addressing	4 byte IP address or MAC ID (00-0F-69-xx-xx-xx) configurable via DHCP server or MOVITOOLS® MotionStudio version 5.5 and higher, default address 192.168.10.4 (depending on the setting of DIP switch S12/1)
Supported services	FC3, FC16, FC23, FC43



9.6 Options and accessories

Type	Figure	Content	Part number
Ethernet closing plug for push-pull RJ45 socket		10 pc	1 822 370 2
		30 pc	1 822 371 0
RJ45-M12 Ethernet adapter RJ45 (internal) M12 (external) 2 required for each unit.		1 pc	1 328 168 2
Screw plug for interfaces on the EBOX		1 pc	1 813 062 3

9.6.1 Accessories for the wet area design

Type	Figure	Content	Size	Part number
Stainless steel screw plugs		10 pcs	M16 x 1.5	1820 223 3
		10 pcs	M20 x 1.5	1820 224 1
		10 pcs	M25 x 1.5	1820 226 8
EMC cable gland (brass, nickel plated)		10 pcs	M16 x 1.5	1820 478 3
		10 pcs	M20 x 1.5	1820 479 1
		10 pcs	M25 x 1.5	1820 480 5

9.7 Required connection cables for single-line installation

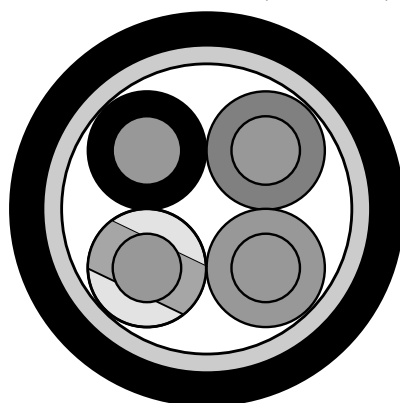
SEW-EURODRIVE prescribes the following cables types for the connection between [MOVIGEAR® / DRC] SNI drive units and SNI controllers:

9.7.1 HELUKABEL TOPFLEX®

- **HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J**
- **HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J/UL/CSA**
(UL-compliant installation)
- **HELUKABEL TOPFLEX® – EMV-2YSLCY-J**

The following figure shows the cable structure:

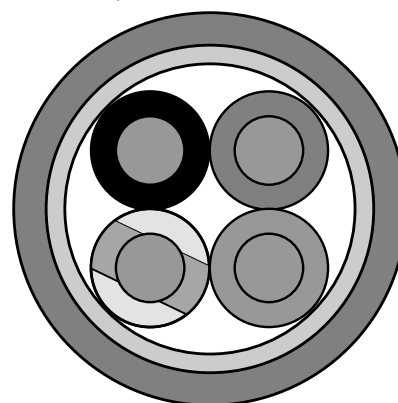
HELUKABEL TOPFLEX®
– EMV-UV-2YSLCYK-J
– EMV-UV-2YSLCYK-J/UL/CSA
Black outer cable sheath (UV-resistant)



2393726347

HELUKABEL TOPFLEX® – EMV-2YSLCY-J

Transparent outer cable sheath

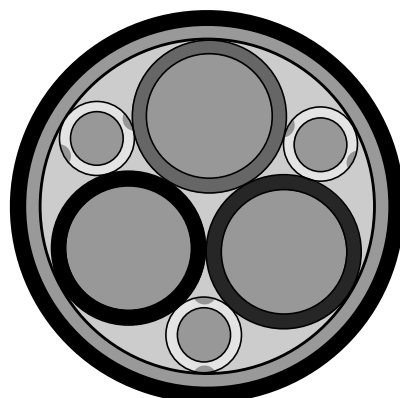


2688418699

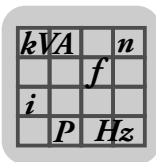
- **HELUKABEL TOPFLEX® – EMV-UV-3 PLUS 2YSLCYK-J**

The following figure shows the cable structure:

HELUKABEL TOPFLEX® – EMV-UV-3 PLUS
2YSLCYK-J
Black outer cable sheath (UV-resistant)



4848585355

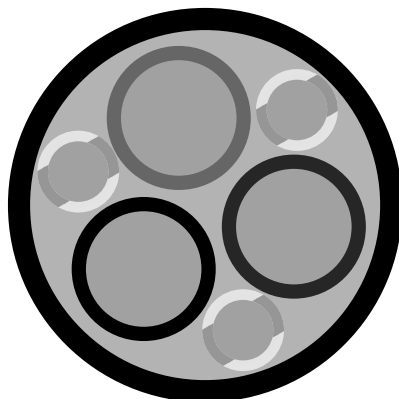


9.7.2 LAPP ÖLFLEX®

- **LAPP ÖLFLEX® SERVO 2YSLCYK-JB**
LAPP ÖLFLEX® SERVO 2YSLCY-JB

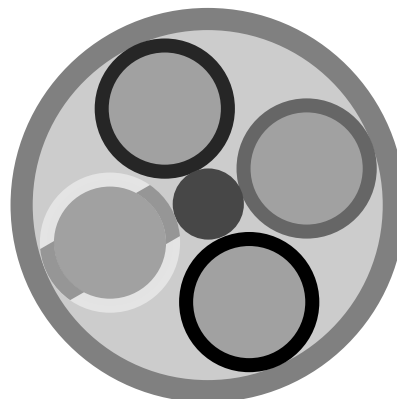
The following figures show the cable structure:

LAPP ÖLFLEX® SERVO 2YSLCYK-JB
Black outer cable sheath (UV-resistant)



3336402059

LAPP ÖLFLEX® SERVO 2YSLCY-JB
Transparent outer cable sheath



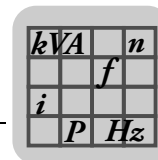
2640950539



INFORMATION

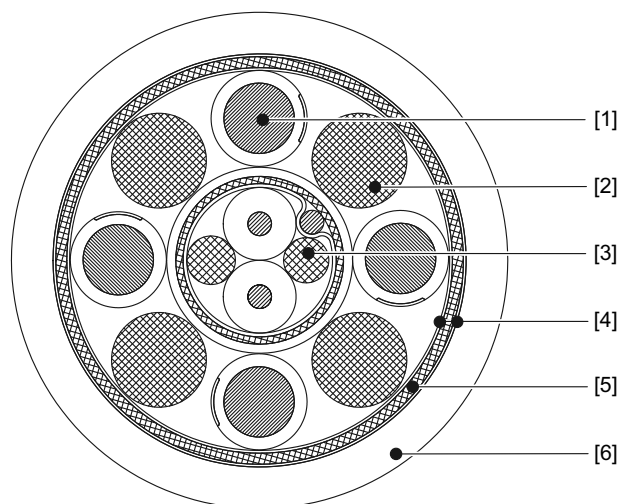
A high signal quality is achieved due to the low operating capacitance of the specified cables.

The shielding prevents interference emission resulting from the data transmission modulated onto the line.



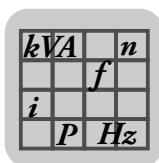
9.8 Specification of recommended hybrid cables

SEW-EURODRIVE recommends the following hybrid cables for the connection between [MOVIGEAR® / DRC] DSC drive units and controllers: The following figure shows the structure of the hybrid cable:



2389090443

	Type: LEONI Elocab EHRK 016281	Type: LEONI Elocab EHRK 018473
[1]	4 cores 2.5 mm ² Conductor (141 x 0.15 mm) blank copper Insulation TPE Colors Black, with printed numbers 1-3 1 x yellow-green	4 cores 4.0 mm ² Conductor (228 x 0.15 mm) blank copper Insulation TPE Colors Black, with printed numbers 1-3 1 x yellow-green
[2]	Filler	
[3]	1 conductor pair 0.25 mm ² Conductor (19 x 0.13 mm) blank copper Insulation PE Colors White/blue	
	Foil shield Aluminum-clad side toward the braided shield Opt. cover 100%	
	Drain wire 0.25 mm ² Conductor (19 x 0.13 mm) blank copper	
	Shield Braided Conductor (0.10 mm) tin-plated copper	
	Sheathing TPE Color Purple	
[4]	Windings	
[5]	Shield Braided Conductor (0.161 mm) tinned copper Opt. cover at least 85%	
[6]	Outer sheath Polyurethane, flame retardant, halogen-free Color Black	




Technical Data

Specification of recommended hybrid cable

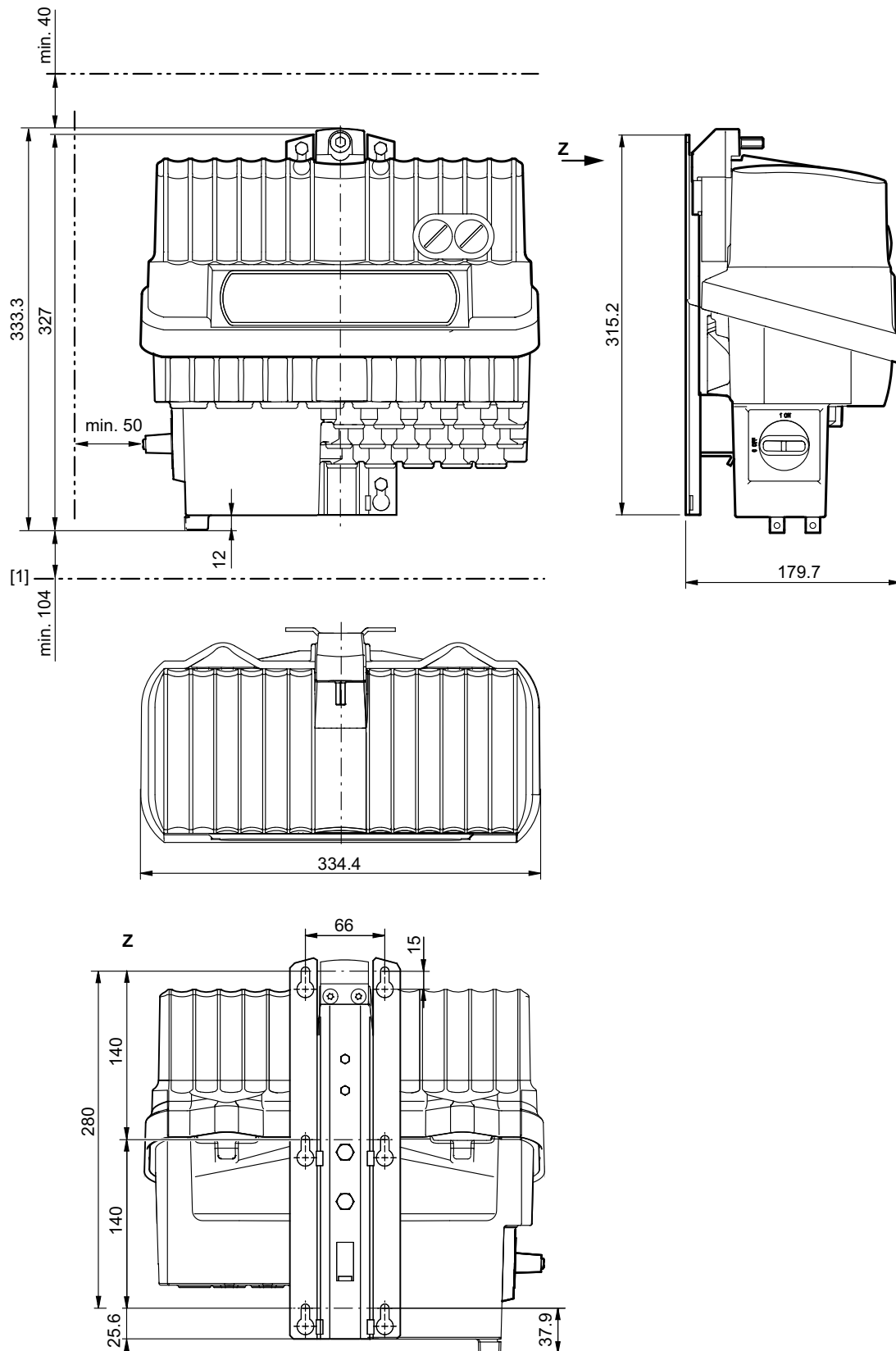
9.8.1 Technical data of hybrid cables

The following table shows the technical data of the hybrid cable:

Properties	Type: LEONI Elocab EHRK 016281	Type: LEONI Elocab EHRK 018473
UL features	UL style 20234 80 °C 1000 V c  certified 80 °C 600 V	
Operating voltage	1000 V	
Test voltage core/core	DC 4700 V	
Test voltage core/shield	DC 3110 V	
Test voltage shield Position [3]	DC 3000 V (spark test)	
Operating temperature	-30 °C to +80 °C (fixed installation)	
Weight of cable	Nom. 291 g/m	Nom. 333 g/m
Wave impedance Position [3]	120 Ω .. ± 10%	
Attenuation Position [3]	Nom. 1.8 dB / 100 m at 1 MHz Nom. 5.6 dB / 100 m at 10 MHz	
Delay Position [3]	Nom. 5 ns / m	
Bending radii	Single bending when routing the cable: 2x cable diameter	

9.9 Dimension drawings

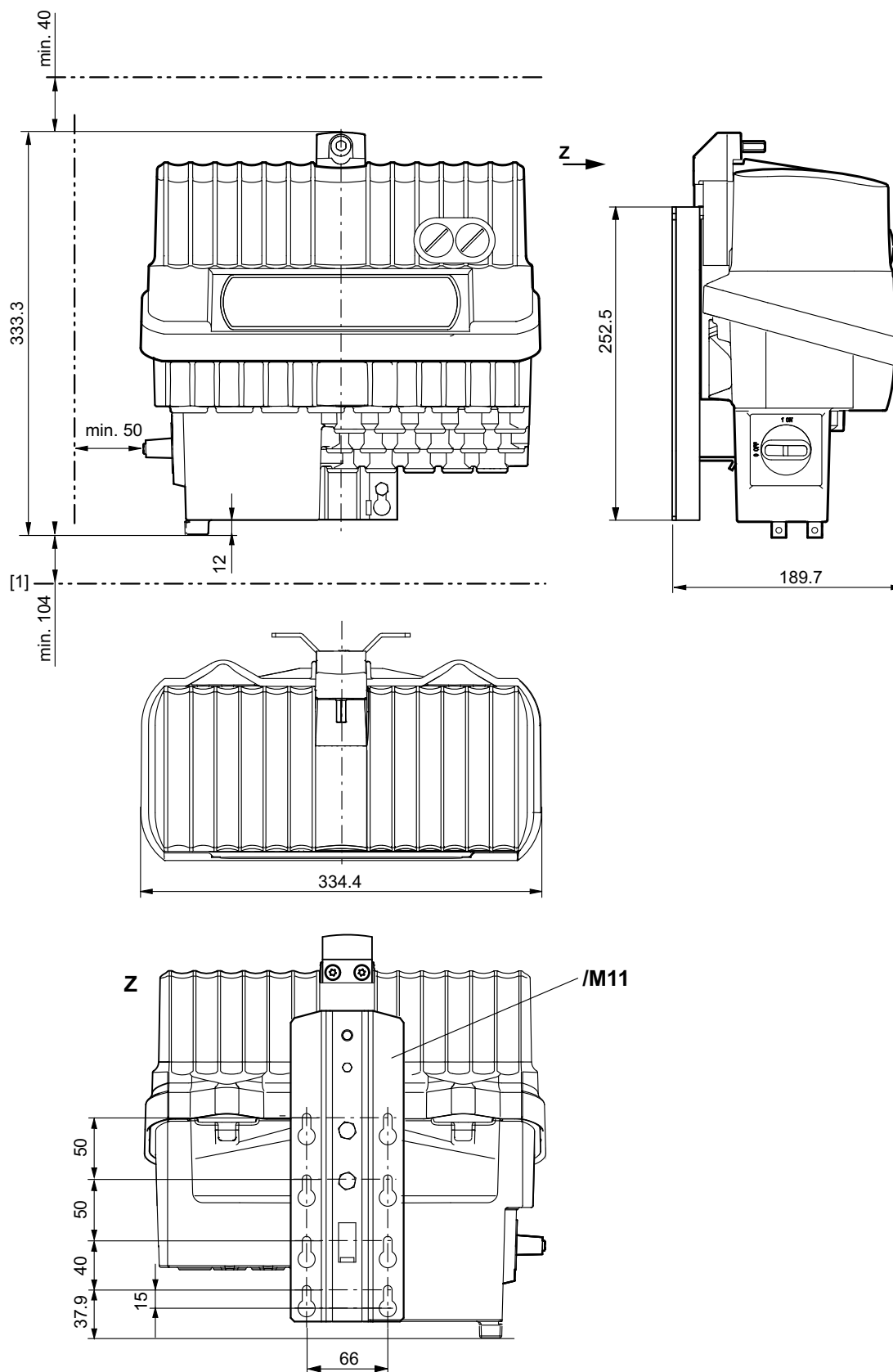
9.9.1 MOVIFIT® FDC with standard mounting rail



9007202299196811

[1] The clearance of 104 mm below is only necessary for ABOXes with plug connector for connecting the drive unit.

9.9.2 MOVIFIT® FDC with optional stainless steel mounting rail M11

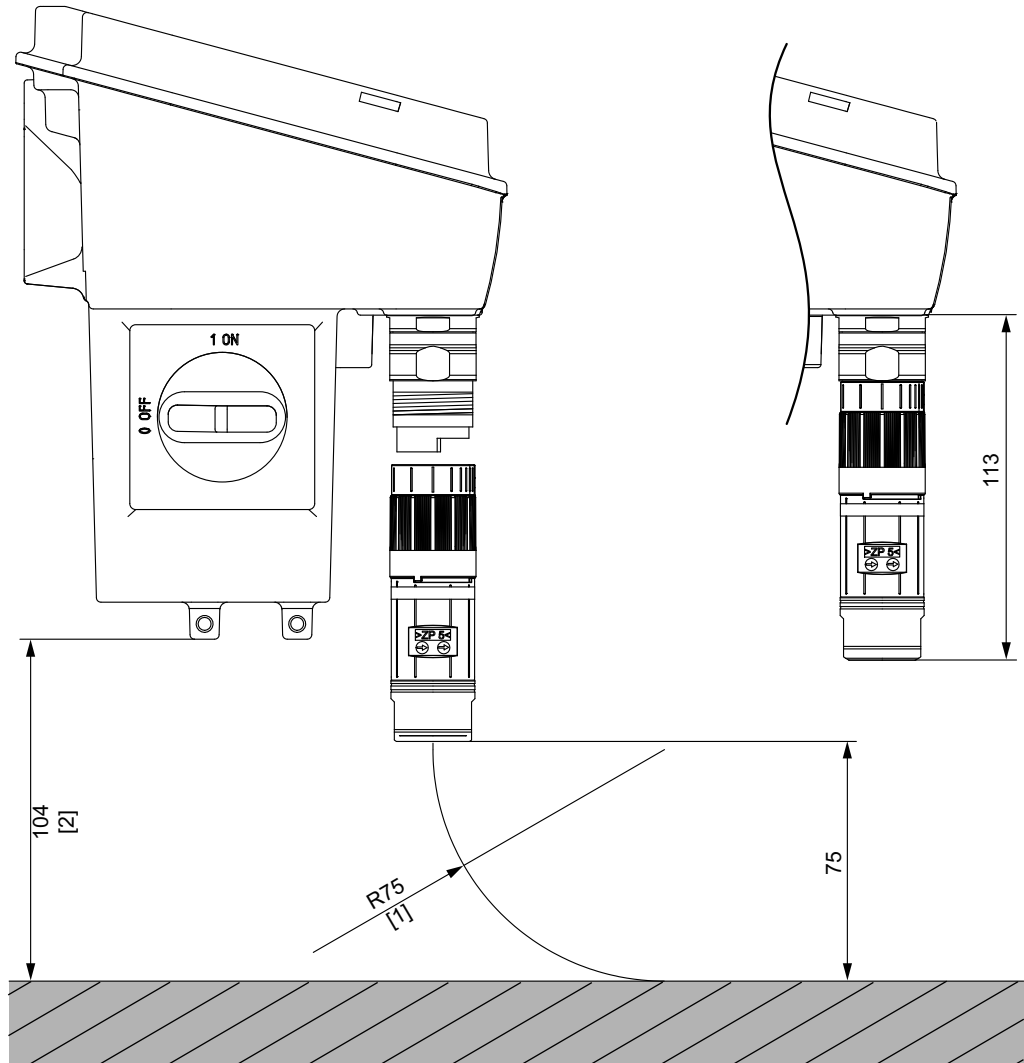


9007202299198731

[1] The clearance of 104 mm below is only necessary for ABOXes with plug connector for connecting the drive unit.

9.9.3 ABOX with plug connector for connecting the drive units

The following figure shows the minimum installation clearance of the hybrid ABOX with plug connector for connecting the drive units.



5633883019

[1] Smallest permitted pending radius of bulk cable: 75 mm

[2] Minimum distance to the bottom of the ABOX: 104 mm



10 Declaration of Conformity

EC Declaration of Conformity

SEW
EURODRIVE

900420010

SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Straße 42, D-76646 Bruchsal

declares under sole responsibility that the

drive systems of the series **MOVIPRO® SNI controller**
 MOVIFIT® SNI controller

are in conformity with

Low Voltage Directive **2006/95/EC**

EMC Directive **2004/108/EC** 4)

applied harmonized standards **EN 61800-5-1:2007**
 EN 61800-3:2007



- 4) According to the EMC Directive, the listed products are not independently operable products. EMC assessment is only possible after these products have been integrated in an overall system. The assessment was verified for a typical system constellation, but not for the individual product.

Bruchsal 11.12.09

Place

Date

Johann Soder
 Managing Director Technology

a) b)

- a) Authorized representative for issuing this declaration on behalf of the manufacturer
 b) Authorized representative for compiling the technical documents

3123006091



11 Address List

Germany			
Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Industrial Gears	Bruchsal	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str.10 D-76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Service Competence Center	Central	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 sc-mitte@sew-eurodrive.de
	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (near Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 sc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 sc-ost@sew-eurodrive.de
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	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 sc-elektronik@sew-eurodrive.de
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357 14 euro cents/min on the German land-line network. Max 42 euro cents/min from a German mobile network. Prices for mobile and international calls may differ.
	Additional addresses for service in Germany provided on request!		

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	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
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Service Competence Center	Industrial Gears	SEW-EURODRIVE n.v./s.a. Rue de Parc Industriel, 31 BE-6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-wallonie@sew-eurodrive.be
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Cameroon			
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	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. Tilbury Industrial Park 7188 Honeyman Street Delta, BC V4G 1G1	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
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Assembly Sales Service	Suzhou	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn



China			
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267922 guangzhou@sew-eurodrive.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn
	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn
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Czech Republic			
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		SEW-EURODRIVE CZ s.r.o. Lužná 591 16000 Praha 6 - Vokovice	
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Sales Service	Cairo	Copam Egypt for Engineering & Agencies 33 El Hegaz ST, Heliopolis, Cairo	Tel. +20 2 22566-299 +1 23143088 Fax +20 2 22594-757 http://www.copam-egypt.com/ copam@datum.com.eg



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Assembly Sales Service	Lahti	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Production Assembly	Karkkila	SEW Industrial Gears Oy Valurinkatu 6, PL 8 FI-03600 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 sew@sew.fi http://www.sew-eurodrive.fi
Gabon			
Sales	Libreville	ESG Electro Services Gabun Feu Rouge Lalala 1889 Libreville Gabun	Tel. +241 741059 Fax +241 741059 esg_services@yahoo.fr
Great Britain			
Assembly Sales Service	Normanton	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate Normanton West Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
Drive Service Hotline / 24 Hour Service			Tel. 01924 896911
Greece			
Sales	Athens	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr
Hong Kong			
Assembly Sales Service	Hong Kong	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk
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Sales Service	Budapest	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu
India			
Registered Office Assembly Sales Service	Vadodara	SEW-EURODRIVE India Private Limited Plot No. 4, GIDC POR Ramangamdi • Vadodara - 391 243 Gujarat	Tel. +91 265 3045200, +91 265 2831086 Fax +91 265 3045300, +91 265 2831087 http://www.seweurodriveindia.com salesvadodara@seweurodriveindia.com



India			
Assembly Sales Service	Chennai	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@seweurodriveindia.com
Ireland			
Sales Service	Dublin	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 info@alperton.ie http://www.alperton.ie
Israel			
Sales	Tel-Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il
Italy			
Assembly Sales Service	Solaro	SEW-EURODRIVE di R. Blicke & Co.s.a.s. Via Bernini, 14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SICA Société Industrielle & Commerciale pour l'Afrique 165, Boulevard de Marseille 26 BP 1173 Abidjan 26	Tel. +225 21 25 79 44 Fax +225 21 25 88 28 sicamot@aviso.ci
Japan			
Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373855 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp
Kazakhstan			
Sales	Almaty	ТОО "СЕВ-ЕВРОДРАЙВ" пр.Райымбека, 348 050061 г. Алматы Республика Казахстан	Тел. +7 (727) 334 1880 Факс +7 (727) 334 1881 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz
Kenya			
Sales	Nairobi	Barico Maintenances Ltd Kamutaga Place Commercial Street Industrial Area P.O.BOX 52217 - 00200 Nairobi	Tel. +254 20 6537094/5 Fax +254 20 6537096 info@barico.co.ke
Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.com info@alas-kuul.com



Lebanon			
Sales Lebanon	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
		After Sales Service	service@medrives.com
Sales Jordan / Kuwait / Saudi Arabia / Syria	Beirut	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 info@medrives.com http://www.medrives.com
		After Sales Service	service@medrives.com
Lithuania			
Sales	Alytus	UAB Irseva Statybininku 106C LT-63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 irmantas@irseva.lt http://www.sew-eurodrive.lt
Luxembourg			
Assembly Sales Service	Brussels	SEW-EURODRIVE n.v./s.a. Researchpark Haasrode 1060 Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.lu info@sew-eurodrive.be
Madagascar			
Sales	Antananarivo	Ocean Trade BP21bis. Andraharo Antananarivo. 101 Madagascar	Tel. +261 20 2330303 Fax +261 20 2330330 oceanrabp@moov.mg
Malaysia			
Assembly Sales Service	Johor	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Mexico			
Assembly Sales Service	Quéretaro	SEW-EURODRIVE MEXICO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Quéretaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Morocco			
Sales Service	Mohammedia	SEW-EURODRIVE SARL 2, rue El Jahidz 20800 Mohammedia	Tel. +212 523 32 27 80/81 Fax +212 523 32 27 89 sew@sew-eurodrive.ma http://www.sew-eurodrive.ma
Namibia			
Sales	Swakopmund	DB Mining & Industrial Services Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 sales@dbmining.in.na



Netherlands			
Assembly Sales Service	Rotterdam	SEW-EURODRIVE B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl
New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferryroad Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Norway			
Assembly Sales Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no
Pakistan			
Sales	Karachi	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk
Peru			
Assembly Sales Service	Lima	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe
Poland			
Assembly Sales Service	Lodz	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Łódź	Tel. +48 42 676 53 00 Fax +48 42 676 53 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 6765332 / 42 6765343 Fax +48 42 6765346	Linia serwisowa Hotline 24H Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl
Portugal			
Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Romania			
Sales Service	Bucharest	Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro



Russia			
Assembly Sales Service	St. Petersburg	ZAO SEW-EURODRIVE P.O. Box 36 RUS-195220 St. Petersburg	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
Senegal			
Sales	Dakar	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 senemeca@sentoo.sn http://www.senemeca.com
Serbia			
Sales	Beograd	DIPAR d.o.o. Ustanicka 128a PC Košum, IV sprat SRB-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs
Singapore			
Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com
Slovakia			
Sales	Bratislava	SEW-Eurodrive SK s.r.o. Rybničná 40 SK-831 06 Bratislava	Tel. +421 2 33595 202 Fax +421 2 33595 200 sew@sew-eurodrive.sk http://www.sew-eurodrive.sk
	Žilina	SEW-Eurodrive SK s.r.o. Industry Park - PChZ ulica M.R.Štefánika 71 SK-010 01 Žilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-974 11 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk
	Košice	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 SK-040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 sew@sew-eurodrive.sk
Slovenia			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. Ul. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net
South Africa			
Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za info@sew.co.za



South Africa			
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 cfoster@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaco Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PTY) LTD. 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za
South Korea			
Assembly Sales Service	Ansan	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate #1048-4, Shingil-Dong, Danwon-Gu, Ansan-City, Kyunggi-Do Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master.korea@sew-eurodrive.com
	Busan	SEW-EURODRIVE KOREA Co., Ltd. No. 1720 - 11, Songjeong - dong Gangseo-ku Busan 618-270	Tel. +82 51 832-0204 Fax +82 51 832-0230 master@sew-korea.co.kr
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 Fax +34 94 43184-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Swaziland			
Sales	Manzini	C G Trading Co. (Pty) Ltd PO Box 2960 Manzini M200	Tel. +268 2 518 6343 Fax +268 2 518 5033 engineering@cgtrading.co.sz
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442 00 Fax +46 36 3442 80 http://www.sew-eurodrive.se jonkoping@sew.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Thailand			
Assembly Sales Service	Chonburi	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com



Tunisia			
Sales	Tunis	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 79 40 88 77 Fax +216 79 40 88 66 http://www.tms.com.tn tms@tms.com.tn
Turkey			
Assembly Sales Service	Istanbul	SEW-EURODRIVE Hareket Sistemleri Sanayi Ticaret Limited Şirketi Gebze Organize Sanayi Bölgesi 400.Sokak No:401 TR-41480 Gebze KOCAELİ	Tel. +90-262-9991000-04 Fax +90-262-9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr
Ukraine			
Assembly Sales Service	Dnipropetrovsk	ООО «СЕВ-Евродрайв» ул.Рабочая, 23-В, офис 409 49008 Днепропетровск	Тел. +380 56 370 3211 Факс. +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua
United Arab Emirates			
Sales Service	Sharjah	Copam Middle East (FZC) Sharjah Airport International Free Zone P.O. Box 120709 Sharjah	Tel. +971 6 5578-488 Fax +971 6 5578-499 copam_me@eim.ae
USA			
Production Assembly Sales Service	Southeast Region	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manufacturing +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly Sales Service	Northeast Region	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Additional addresses for service in the USA provided on request!		
Venezuela			
Assembly Sales Service	Valencia	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve ventas@sew-eurodrive.com.ve sewfinanzas@cantv.net



Vietnam			
Sales	Ho Chi Minh City	All sectors except harbor, steel, coal power and offshore: Nam Trung Co., Ltd 250 Binh Duong Avenue, Thu Dau Mot Town, Binh Duong Province HCM office: 91 Tran Minh Quyen Street District 10, Ho Chi Minh City	Tel. +84 8 8301026 Fax +84 8 8392223 namtrungco@hcm.vnn.vn truongtantam@namtrung.com.vn khanh-nguyen@namtrung.com.vn
		Harbor and offshore: DUC VIET INT LTD Industrial Trading and Engineering Services A75/6B/12 Bach Dang Street, Ward 02, Tan Binh District, 70000 Ho Chi Minh City	Tel. +84 8 62969 609 Fax +84 8 62938 842 totien@ducvietint.com
		Coal power and steel: Thanh Phat Co Ltd DMC Building, L11-L12, Ward3, Binh Thanh Dist, Ho Chi Minh City	Tel. +84 835170381 Fax +84 835170382 sales@thanh-phat.com
	Hanoi	Nam Trung Co., Ltd R.205B Tung Duc Building 22 Lang ha Street Dong Da District, Hanoi City	Tel. +84 4 37730342 Fax +84 4 37762445 namtrunghn@hn.vnn.vn
Zambia			
Sales	Kitwe	EC Mining Limited Plots No. 5293 & 5294, Tangaanyika Road, Off Mutentemuko Road, Heavy Industrial Park, P.O.BOX 2337 Kitwe	Tel. +260 212 210 642 Fax +260 212 210 645 sales@ecmining.com http://www.ecmining.com



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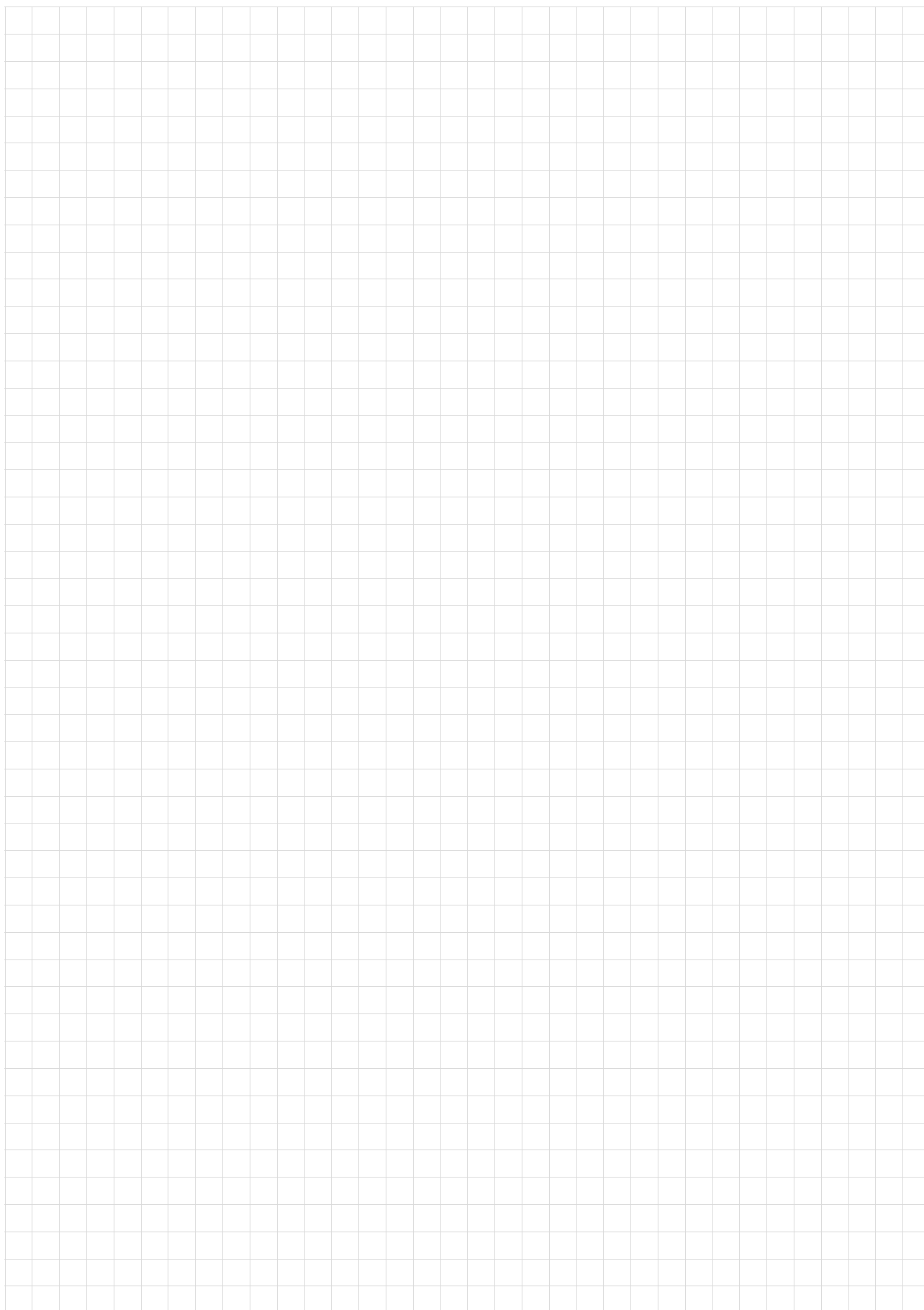
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SEW
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SEW-EURODRIVE GmbH & Co KG
P.O. Box 3023
D-76642 Bruchsal/Germany
Phone +49 7251 75-0
Fax +49 7251 75-1970
sew@sew-eurodrive.com

→ www.sew-eurodrive.com